Developing teaching models for teaching in larger group master programs

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Developing Teaching Models for Teaching in Larger Group Master Programs

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ABSTRACT
Students enrolled in the Master Programs at the School of the Built Environment, University of Technology have vastly different cultural background and come from diverse contexts and experiences. A significant and substantial increased in the number of students in the Master programs over the previous years have raised issues of teaching quality, students satisfaction and administrative problems. Many existing literatures have discussed issues of large class teaching for undergraduate students. This study concerns teaching models of large class for Master students in Australia. The investigation begins with exploring good practices of Master Programs teaching in large class size from NSW universities through CEQ score. Questionnaire is developed and interviews are conducted to the selected participants. Collected data are then analysed for developing teaching models for the Master Programs. The findings suggest that students’ satisfaction can be maintained with large classes teaching when large group lectures followed by small group of tutorials, tailored-making teaching methods are used and timely assessment feedback are provided.

KEYWORDS
large class teaching, student satisfaction, CEQ, Master Programs, Australia

INTRODUCTION
The demand for Higher Education has increased worldwide accompanying a change in political and social environments in nowadays (Trow, 2005). An outcome of the increased demand is large class teaching which is more complex than teaching in small class. The problems associated with large classes vary with the discipline, the nature of the class such as lecture, tutorial, lab work or workshop, and perception of the lecturers and students (Ramsden, 2008). Academics have to deal with more diverse population of the students, difficult to engage and communicate with other staff and students and have greater administrative issues for a large class (Eccles, et al 2008).

The Master Programs, namely, Master of Planning, Master of Project Management and Master of Property Development, is housed within the School of the Built Environment.
(SBE), University of Technology Sydney (UTS). The courses are unique and well received because the courses are practical orientated. There were large student numbers, i.e., more than 120 students in a class for the first year Master classes. Students enrolled in the Master Programs have vastly different cultural backgrounds and come from diverse contexts and experiences.

The large class teaching has highlighted a number of issues and concerns for the teaching staff to manage their teaching. Some of the feedbacks from lecturers highlight issues in large class teaching:

- An appropriate teaching and learning environment is difficult created;
- Little opportunity for arranging student interaction in large class lecture;
- Time consuming and effort needed for providing in time assessment feedbacks to students;
- Resources required and timetable difficulties for arranging independent learning activities such as tutorials;
- Difficult to support English as second-language students and help with their special needs.

The identified issues are consistent with problem findings from other universities (Tolhurst and Baker, 2003; Eccles, et al., 2008). Large class teaching could discourage students’ learning activities and result in lower student satisfactions on their learning. In addition, some administrative issues, such as additional involvement of resources, reconstruction of course and teaching team, balance of costs and benefits of revenues, effective management system and staff training requirements must be faced in large class teaching. Developing appropriate teaching models that enhance student learning in large class environment and maintain student satisfactions are challenges.

This paper explores the successful strategies that can be adopted for large class teaching in the Master courses at the School of the Built Environment. The paper is organised in the following sequence: a) reviewing literature with regards to the problems and effectiveness of learning and teaching in large classes; b) discussing research methodology to address the problems; c) developing teaching models for the Master Programs and then concluded.

**LITERATURE REVIEW**

The central theme of the literature over the last decades focuses on students’ expectations of their educational experience (Gibbs, Lucas and Simonite, 1996; Biggs and Tang, 2007). Larger student population and diversity has changed the idea of set goals and single experience (Ramsden, 2008). There are benefits of teaching large classes, such as plenty of students for interaction and a rich variety of human resources. However,
problems of control and management are challenges built in with the large classes (Hess, 2001). Myron-Wilson and Smith (1998) identified the influence of class size on teaching and learning and the effects that class sizes have on student satisfaction, self-esteem or attitudes to study. According to the research findings of Teaching and Educational Development Institute (2001), large classes lead inevitably to increased diversity and complexity, in particularly, the problems associated with a greater administrative burden, difficulties in communicating, promoting active participation and monitoring student progress. Thus, large classes undermine the quality of teaching and detract from the learning experience of the students. Stork (2003) advised that lecturers often found difficulty in creating a teaching environment that meets students’ needs in large classes. The contextual difficulties such as divergent instructor personalities and teaching styles often reduce effective teaching results in classes where each student prefers a different learning approach (Schlee, 2005; Cope and Staehr, 2005). Athiyaman (1997) identified class size, level and difficulty of subject content, and student workload are the main determinants of student satisfaction.

Students’ preferences of class size and concerns about the impact of class sizes on their learning depends entirely on his/her previous experiences (Myron-Wilson and Smith, 1998). Feigenbaum and Friend (1992) suggested that first year psychology students usually favour the greater interaction involved with small classes and more experienced students tend to prefer large class teaching. The findings was confirmed by the research of Papo (1999), who conducted a survey to 246 undergraduate second to fourth year students from various faculties and investigated learning problems associated with class size.

Herington and Weaven (2008) encourage a student-centred approach which enhances student learning experiences in classes. A student-centred approach is focused on the student's needs, abilities, interests, and learning styles with the lecturers as a facilitator of learning (Barr and Tagg, 1995). A multiple-models approach to teaching students was suggested by Joyce et al (2000) as large classes usually mean a wide range of student backgrounds and abilities. Some teaching methods such as tutorials and laboratories are impossible to implement in large classes; unless the large classes are broken up into small groups.

The relationship between learning approaches, student satisfaction and student results were analysed by Biggs (2003) (Refer to Figure 1) and investigated commonly by opinion surveys and student ratings of teaching efficacy (Crittenden, et al. 1975; Feldman, 1984). Gibbs, et al. (1996) argued that these measuring tools provide information on student satisfaction and rating of teaching only. There are also fundamental biases inherent in the
interpretation of students’ ratings of their classes because many students express satisfaction for variables unrelated to those being measured.

Gibbs, et al. (1996) and Kelly (2001) suggested that a major problem faced by students in large classes is the scarcity of learning resources included both material and human. Examples of scarcity of material are the over-crowded computer and science laboratories and limited access resources. Students’ performances in large classes are affected by difficult access to tutors and slow and minimal feedback on assessment. To improve teaching efficacy, the utilising of internet could be one of the innovative technologies to support large classes learning and teaching. Freeman (1996) reported the outcomes of an internet trial for enhancing the learning environment on various university stakeholders, i.e., academic managers, staff and students. He found that utilising the internet would improve staff-student interactions, student access to learning resources and assessment in large classes. Housego and Freeman (2000) presented five fictional case studies for undergraduate business courses and concluded that technology supported teaching i.e., employing web based learning (WBL) tools into the teaching environment, can be effective and improve student learning outcomes.

The continued provision of quality teaching in large classes and the maintenance of student satisfaction are important because student performance is linked to influences, such as feelings of inclusion and value (TEDI, 2001). Much of the research in this area is dated and focused on undergraduate rather than Master studies or the higher education system in the USA and UK, rather than Australia. In Australia, Master students are often mature, have a few years working experiences and expect to learn relevant knowledge in depth through reasoning and discussions. In particular, Master students in the disciplines of built environment tend to focus on practical applications rather than theory in nature, such as feasibilities studies, Case analysis, modelling and methods of risk mitigations on
The teaching models for large undergraduate classes may not be appropriate to the Master students. This paper will address large class teaching of the Master Courses in Australia. The research and findings could contribute to existing knowledge by filling a 'gap' in knowledge of large class teaching at Master level students in Australia.

RESEARCH DESIGN
This research is designed to learn experiences and practices in large class teaching within UTS and the universities around Sydney. The findings are then studied and analysed. The strategies that can be applied in the Master Programs at School of the Built Environment UTS are drawn for testing. The rationale for the research design is that lecturers face the same challenges in large class teaching and students’ satisfactions on learning experiences are influenced by class sizes. This research methodology is consistent with targeted sampling followed by a case study methodology (Yin, 1984, p.23). Empirical inquiry is used in a contemporary and real-life setting to provide the basis for the application of ideas that bring an improved understanding of complex issues (Utexas, 2009). Accordingly, the research involves identifying similarly large class teaching in Master Programs within UTS and other universities. Questionnaire for interviewing academic lecturers involved in large class teaching is then developed. The responses of questionnaire and interview are studied in-depth. Models adopted in the Master Programs at the School of Built Environment UTS thus can be developed. Figure 2 depicts the research framework.

Figure 2 – The research framework
Selecting participants and interviewees

Published Course Experience Questionnaire (CEQ) scores are used as criteria for selecting the Master Programs and Universities to participate the research. The CEQ is the national survey of all university graduates conducted annually by the Graduate Careers Council of Australia (GCCA) that provides a national performance indicator of the quality of teaching and the major source of comparative data on student satisfaction with the overall course experience (McInnis, et al., 2001). The higher the CEQ scores are, the higher the student satisfaction; the better the teaching practice and stronger the management support to students. Forsythe and Zou (2005) used the CEQ scores to study on improving student satisfaction in undergraduate construction management studies. By analysing the CEQ results, the best teaching and learning Master Programs which have the strongest conceptual similarity with the professional and management oriented degrees’ Master programs in the School of the Built Environment (SBE) can be identified and selected for this study. The 2008 published CEQ scores from NSW universities were collected and used for this study.

The 2008 CEQ scores of overall student satisfaction for universities in the New South Wales Australia are shown in the Table 1. This research concerns large classes for Master students undertaking Built Environment courses. Thus, three principles are considered for selecting the interviewees, i.e., (1) Large class teaching; (2) Relevant or similar field of study; and (3) the higher CEQ score. Seven members from the University of Wollongong (UOW) and the University of New South Wales (UNSW) were selected as the universities received the higher student satisfaction level for both undergraduate and postgraduate programs. In addition, six UTS members from the large programs in the School of Business and Engineering were also selected for the study.

Table 1 – Overall CEQ scores in 2008 in Australia (source: UTS database)

<table>
<thead>
<tr>
<th>Name of the university</th>
<th>CEQ UG</th>
<th>CEQ PG</th>
<th>CEQ Programs with large class teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uni of New England</td>
<td>59</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>University of Wollongong</td>
<td>53</td>
<td>51</td>
<td>Business, Admin &amp; Economics (47) Law (54), Engineering, surveying (50)</td>
</tr>
<tr>
<td>Southern Cross University</td>
<td>34</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Charles Stuart University</td>
<td>35</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Uni of New South Wales</td>
<td>42</td>
<td>39</td>
<td>Civil engineering (39) Business (40)</td>
</tr>
<tr>
<td>The Macquarie University</td>
<td>38</td>
<td>37</td>
<td>Architecture (50)</td>
</tr>
<tr>
<td>University of Newcastle</td>
<td>30</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Uni of Technology Sydney</td>
<td>34</td>
<td>34</td>
<td>Engineering, surveying (42) Business, Admin &amp; Economics (35)</td>
</tr>
<tr>
<td>University of Sydney</td>
<td>36</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Uni of Western Sydney</td>
<td>36</td>
<td>32</td>
<td>Building (50)</td>
</tr>
</tbody>
</table>
The data collected for research is considered valid because the interviewees include all level of academic staff such as Dean, Head of School, Associate Professors, Senior Lecturers, Lecturers and Casual Lecturers, who have experience in large class teaching. Also, the interviewees are represented in variety discipline areas, crossing business, engineering, property, law, planning and project management in the respected and reputable Master Programs of NSW universities.

*Developing questionnaire*

Interview questionnaire was developed in accordance with literatures. There are two parts of questions in the developed questionnaire. The first part of the questionnaire constitutes eleven generic questions included general information of the participants and program involvement. Examples of the questions are:

- Name of respondent and position
- Name of educational program
- Name of university
- How many full time lecturers in the program?
- How many part time lecturers in the program?
- How many administrative staff in the program?
- With your best knowledge, what is student/staff ratio in the program?
- What is average coordinating and marking role for each staff?
- What are the roles of a course director?

The second part of the questionnaire contains forty one questions including quantitative and qualitative inquiry what teaching methods and strategies they have adopted in the large class teaching. Questions on student numbers, student to staff ratio, staffing combination, creative use of digital and other innovative forms of learning are included. Some sample questions are:

- What is name of the subject/unit and code number?
- How many students in the subject?
- What is the mode of teaching?
- Are you used to and comfortable in teaching large classes?
- How the subject is delivered?
- Do the students need extra attention and how do you support them?
- What help do you have to teach your large class?
- How do you assess your students?
- What do you rank as the most important thing to assess?
- Do you do all the marking?
How do you provide feedback?
What major problems are experienced in teaching large classes?
What support is provided to you?
Has student performance diminished with teaching large classes?
What strategies have you adopted to assist you when teaching your large class?
What is the relationship between class size and student feedback rating, such as Student Feedback Survey?

Unstructured interviews were also undertaken during August to November 2009. The answers from interviews were recorded both on the questionnaire sheet and voice recorders. Both these sources of data were organised into a coherent set of answers for each respondent. The answers then were sorted, compared and analysed.

A detailed contextual study of collected information from the selected Masters programs is analysed and then expressed in terms of strengths and weaknesses as well as relationships among the strategies used – as compared to the SBE Masters programs. Models and the guidelines for implementing these models of teaching and learning for large classes that concurrently maintain high levels of student satisfaction will be developed.

RESEARCH FINDINGS AND DISCUSSIONS

Five questions are selected for discussing and analysing as examples of the entire research in this paper.

What size of students is constituted a large class for your subject?

A large class constitutes 40 to 120 students were advised by the participants. This is consistent with the literature which indicated more than 50 students constitute a large class (UNESCO, 2006, p.01). The findings suggest that the perception of what is a large class depends on lecturers’ prior teaching experiences. Lecturers who began their career teaching from small classes may find it difficult to adapt teaching in large classes in the later years. Conversely, lecturers who began teaching large classes would progress to adapt easily to teaching even larger classes.

According to Biggs and Tang (2007), the major factors associated with the large class teaching are:

a) Planning and teaching
b) Planning and conducting assessment
c) Administration and management
d) Tutoring and demonstrating
Each of these factors needs serious consideration while designing strategies for teaching in the large classes. Lecturers are required to adapt their teaching and instructional practices to suit a variety of learning profiles and learning outcomes (Subban, 2006) in large diverse classes because individuals do not learn in the same way (Fischer and Rose, 2001). However, lecturers can generally perform their core duty of knowledge delivery if they are supported with the workload such as preparation of laboratory equipment and uploading documents on systems by others (Biggs and Tang, 2007).

**How do you deliver your lectures and in what way are they supported?**

Tutorial, small group work, problem-based learning and online support through WebCT, discussion board and emails are identified by all the interviewees. Other identified methods include demonstration, online quizzes, computer labs and case studies.

Learning styles can be caused by diversity of culture background (Garger and Guild, 1998). Herington and Weaven (2008) studies methods of improving the learning styles and outcomes of first year university students within large class environments using action research approach. They found that a more student-centred (self-regulated) teaching style can lead to re-engagement of students and maintain student satisfaction with courses regardless of the employed learning style. They also found that tutorial session may encourage students to be more engaged in class activities, but it does not necessarily promote deeper approaches to learning.

Universal Design for Learning (UDL) and Differentiated Instruction (DI) are the two contemporary education practices addressed the diverse learners. According to CAST (2006), the UDL is ‘a framework for designing curricula that enable all individuals to gain knowledge, skills, and enthusiasm for learning’. A universally designed curriculum has been specifically designed, developed, and validated to meet the needs of the full range of students (Hitchcock and Stahl 2003).

Differentiated instruction was suggested by some researchers as positive outcomes that can be produced. Differentiated instruction refers to ‘teaching that is adapted to take into account the range of individual differences and needs of students in any one classroom’ (van Kraayenoord 1997). Under this teaching method, the curriculum, teaching structures, and teaching practices can be modified to ensure that instruction is relevant, flexible, and responsive, leading to successful achievement, and the development of students. Johnsen (2003) studied the effects of using differentiating instruction to suit students with different ability levels and found that the use of differentiated techniques proved to be engaging, stimulated student interest and provide a gratifying experience for the undergraduate teachers.
Assessment tasks in the taught postgraduate courses

A major factor that contributes towards the satisfaction of students and lecturers is the assessment of grades for the students (Biggs and Tang, 2007, p.232). Individual assignments, group projects and final examination are commonly mixed mode assessments in the Master courses.

Assessment is a central element in the overall quality of teaching and learning in higher education and an integral component of a coherent educational experience (CSHE, 2011). Well designed assessments are usually included, clear expectations, established, reasonable workload, and provided opportunities for students to self-monitor, rehearse, practise and receive feedback. Essays, group projects and presentations had become to dominate the pattern of student assessments, instead of examination. This is because lecturers believe that the assessment methods stimulate students to more effective learning. However, lecturers are stressed out from the volume of marking required with large classes (Ward and Jenkins, 1992). Marking becomes an enormous task and some lecturers need to spend their weekend marking students over 100 scripts.

Students expect to see a clear relationship between lectures, tutorials and other resources; and how grades are determined, as well as timely feedback. Students would be satisfied when the feedbacks have explained the grade they have received and suggestions for how they can improve (CSHE, 2011). Lecturers usually found it difficult to provide timely feedback to individual students in large classes.

Do large classes make you feel that some students need extra support?

Large class teaching has limited lecturer’s ability to interact with students in their class. Ten out of thirteen interviewees assume that some students need extra support. The identified points of needing extra support are: (a) students with language difficulty; (b) individual learning ability and learning style; and (c) different in previous skills and experiences. It is obviously difficult for lecturers to provide additional support for all students in a large class. Techniques of how do lecturers support students in need in large classes are thus required for further investigation.

Student performance has diminished with larger class sizes

Table 2 shows that eight out of thirteen interviewees (61.5%) agreed that student performance has diminished with large class teaching, two of the interviewees said ‘No’, two answered “Depends” and one showed “Neutral”. A similar question was asked ‘Student grades and grade distribution have changed with larger class sizes’. Seven out of thirteen ticked “Yes” and another six responded “No”. However, there were eleven out of thirteen (84.6%) answer “Yes” on a question ‘The quantity, duration and cognitive level
of interaction among students and lectures have declined as class size increased’ and only two rejected the claim.

Table 2 – Student performance has diminished with larger class sizes

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>OTHERS (Depends)</th>
<th>NEUTRAL (Maybe)</th>
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<tr>
<td>E1</td>
<td>✓</td>
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<td>E2</td>
<td>✓</td>
<td></td>
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<tr>
<td>E3</td>
<td>✓</td>
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<td>E13</td>
<td>✓</td>
<td>✓</td>
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</table>

In term of a question on ‘whether a negative relationship between class size and student ratings’, among the 13 responses, seven indicated ‘Yes’, four showed ‘No’ and two ticked ‘Depends’. The results are consistence with findings of Feldman (1984), who conducted meta-analysis of literature and found 22 studies showing a negative relationship between class size and student ratings, 11 with curvilinear relationship, 2 studies reporting no significant differences, and 2 reporting a positive relationship. Feldman concluded that large class size has a significantly negative influence on student ratings of teaching.

TEACHING MODELS FOR MASTER STUDENTS IN THE BUILT ENVIRONMENT COURSES

Learning and teaching quality can be maintained by (a) selecting appropriate lecturing facilities and technology support; and (b) personal contact with and effective feedback to students which is crucial in maintaining students’ satisfaction. Based on the findings from respected universities, a new model has been derived for enhancing learning and teaching in the Master Programs for the School of Built Environment.

Large classes followed by small group tutorials

The Master Programs in the School of the Built Environment were usually run by block mode of teaching, i.e., each course runs in twice weekends includes Thursday evening, Friday and Saturday full day. The teaching mode is selected to meet students who are willing to study but they have fulltime jobs. With large number of students in a class,
lecture and tutorial cannot be run together. Thus, large classes followed by small group tutorials have been suggested as the most appropriate teaching structure. Through the tutorials, students are able to interact with lecturers for questions. Principle of relevancy-oriented and practical (Lieb, 1991) can be applied in teaching and learning in Built Environment students because significant learning depends on the perceived relevance to the learner’s own purposes (Biddulph & Carr, 1999).

*Selecting appropriate teaching methods for relevant topics*

Lecturers are advised to select appropriate teaching methods in accordance with relevant topics and adopt the technological tools such as computer modelling, and facilities within UTSOnline as a learning platform. Variety of teaching methods reveals a significant way to enhance students learning for preventing students’ boredom (Knox, 1986). Using experiential techniques such as simulations, role plays, case studies, critical incidents, and inquiry teams allows them to filter their perceptions through their own experiences, needs and developmental changes (Galbraith, 1991).

*Improving communication and feedback with students*

Improved communication and feedback enhance lecturer-students’ relationships and contribute to maintain students’ satisfaction. Lecturers are also encouraged to provide timely feedback on assessments and build up personal contacts with students. Feedback is most effective if given immediately after a certain action and if it specifically describes a behaviour (Renner, 1999). Feedback is seen as an essential element in the process of learning, not separate from it (Rogers, 1989). Effective, instant and positive feedbacks on their progress (Bassano, 1986) provide students encouragement and direction (Knox, 1986). Most students have limited time to study as they are working in full/part time jobs. To facilitate their learning, positive, and instant response on their assessment and performance enhances their gain from the time constraint.

*Improving management support on teaching and learning*

Teaching quality cannot be maintained without administrative and management support. There are tensions between increasing class size and preparation time. Appropriateness of facilities to support lecturers is critical, such as software for computer lab tutorial, technology support and tutorial assistance.

**SUMMARY AND CONCLUSION**

This paper has studied teaching and learning experiences of large classes from selected universities. Teaching models that can be applied to enhance student learning experiences in the Master Programs at the Built Environment have been developed. The paper has
also addressed issues of managing effective teams in order to produce quality of teaching, reducing lecturers’ stress and establishing a management system to balance costs and benefits of using resources.

Teaching in a large class involves addressing many of the requirements of good teaching however large class is more complex. Thus this study has identified the crucial issues related to teaching, administration and assessment. Academics have to learn to deal with diverse population of the students in large classes and adopt appropriate teaching models relevant to the subject matter that meet expectation of Master students.

Teaching modes of Master Programs in the School of the Built Environment are much flexible now and have been restructured. For example, core subjects are scheduled to teach twice a year. Large class size can be reduced by separating one group students into two semesters. Lecturers can design teaching mode to suit the subject requirements and students backgrounds. Lecturers are also encouraged to use digital teaching aid for attracting students learning interest.

Models that can be adopted for Master Programs in the School of Built Environment have been developed. The conclusions are that students’ satisfaction can be maintained with large classes when (a) the teaching structure is changed to lectures followed by tutorials; (b) appropriate teaching methods are tailored to relevant topics; (c) timely assessment feedback are provided; and (d) administrative support is provided. In fact, some of the subjects have begun to apply the model into large class teaching. The effects of implementing the developed models require further study.

The study is considered timely and significant because it primarily focuses on students’ learning and will inform subsequent curriculum renewal. In addition, the findings of the proposed investigation could be a useful reference for extending the experiences to benefit other programs within and outside UTS with similar situations.

ACKNOWLEDGEMENT
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