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Teaching Large Classes in Higher Education: Challenges and Strategies

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Abstract

Higher education around the world are experiencing significant growth in student enrolment, as a result, educators face the daunting challenge of teaching larger classes while improving the quality of instruction and subsequent value delivered to students. Large class can become a daunting task to any instructor who has never taught a large class before and teaching a large group of students can be intimidating for both students and instructors. Although teaching large class is a challenge, but it can offer many opportunities for the instructor to improve his teaching and make it more enjoyable and rewarding for both the instructor and the students. The aim of this study is to identify effective teaching and assessment strategies to address the challenges of teaching in large class environment. It focuses on student engagement as a strategy to address the challenges faced by large class learning environments. By focusing on student engagement and adapting teaching and assessment strategies to promote critical thinking, it is possible to overcome the challenges posed by large class environments into opportunities for effective student learning. The study provides valuable direction for faculty faced with teaching and supporting large-class environments in higher education.

Keywords

Teaching, Learning, Assessment, Large Class, Higher Education, Active Learning, Interactive Lecture

1. Introduction

Higher education institutions around the world are experiencing significant growth in student enrolment (Gibbs & Jenkins, 1992). This increased enrolment represents significant changes in many countries' higher education systems and this adds a variety of challenges to classroom teaching that are absent in traditionally sized courses. While this may be unfortunate trend in academic discourse, it appears to be the norm, at least in part, due to evidence that links higher education to improved health, empowerment and economic development (Bloom, Canning, & Chan, 2005; OECD 2008; World Bank, 2002). Large classes have become more common due to the limited availability of teaching staff and sheer student enrolment numbers. These types of classes are prevalent in many universities and are often gateway courses to students' major fields of study (Stanley & Porter, 2002; McInnis, James, & Hartley, 2000). Most introductory courses at universities that fulfil general education requirements often carry large enrolment of students intended for first and second-year students for whom learning in a large class is a new experience (Twigg, 2003; MacGregor, Cooper, Smith, & Robinson, 2000).

These large class settings have historically been heavily lecture-centred, requiring minimal student engagement and expecting little more than memorization of terms and concepts as evidence of student learning. Students in these classes have fewer opportunities to connect with their instructors and peers (Lynch & Pappas, 2017) and these environments

pose real challenges for educators and students alike. McKeachie (2002) argues that the traditional lecture is not always the most engaging format. Large lecture style classes can often lead to minimized interaction with students and reduced focus on collaborative learning structures. Therefore, there is a need for the higher education sector to identify the challenges and opportunities that are unique to large class teaching environments, as well as strategies to address these issues, in order to maintain the quality of student learning in the face of rising class sizes.

The purpose of this study is to identify the challenge of maintaining teaching and learning quality in large-sized classes. It seeks to identify effective teaching strategies to address the challenges of teaching in a large class environment and to provide strategies for promoting student engagement. Large classes are often characterized by less intimacy and trust between students and faculty, with weaker student engagement (Gibbs, 1992). Large classes may be a cost-effective solution to budget crises at some institutions, but they have been criticized by teachers and students for their failure to provide effective instruction, many of which have been documented by researchers (Jungic, Kent, & Menz, 2006). Although large classes facilitate a common background for participants and are economically desirable, however, large classes present several challenges to the educator. Hornsby and Osman (2014) argue that such environments are commonly believed to pose real challenges for experienced and inexperienced instructors who are assigned to teach these classes. One of the great challenges in dealing with large classes lies in how to effectively engage students in a learning process that improves student learning and achieves higher educational goals. The findings from the study will not only help in addressing the conceptual issues of teaching in a large class setting, but it will also provide practical insights for those faculty faced with teaching and supporting large-class environments in higher education.

2. Background

Teaching large class can be a challenge, regardless of experience of the faculty members tasked with teaching these courses may experience frustration, especially if one is doing this for the first time (Kirkwood, 2013). Teaching a large class can be a daunting task to any instructor and teaching a large group of students can be intimidating for both students and instructors alike (Jungic et al., 2006). Teaching and learning in large class is a challenging task that requires careful consideration of the instructor's own teaching characteristics, the nature of student learners in the large class and their specific learning styles and preferences and the learning outcomes instructors are seeking to provide students with. The large-class experience challenges students, especially if they are new to university experience and with so many of their peers listening, many students in large classes feel too intimidated to ask questions (Ives, 2000) or too overwhelmed by the material to approach instructors or others for help. Ives comments that students hesitate in asking questions or in other ways indicating a lack of knowledge and they lack experience with time management, studying, or other skills necessary for success in higher education.

Evidence from literature (Carpenter, 2006) indicates that issues that confront teaching large classes are similar to those of teaching smaller classes as well. These issues include student motivation, provision of feedback, taking attendance, provision of quality instruction, classroom management, and designing quality assessment tasks. However, it is evident that these issues become more demanding when teaching large classes compared to smaller classes. Gibbs (1992) indicates that problems with large classes include: the lack of opportunities for the instructor to get to know students, and for students to form relationships with peers, students do not get to know each other well, and absenteeism increases; Lack of student engagement with course content results in less class participation and increases student anonymity; Faculty have a difficult time being able to relate to such a large number of students and the demands made by them; and Class discussion may be brief and superficial and acoustics, visibility, and attention may become communication issues. Such a lack of communication may make it difficult for faculty to determine if students understand course material (Gibbs, 1992). Similarly, Biggs (1999) adds that large classes mostly foreclose on informal exchanges between faculty and students. The faculty and student interaction suffers as classes increase in size, resulting in passivity among students. It is generally agreed that a passive attitude to learning, lack of student motivation, and minimal opportunities for faculty-student interaction are major factors affecting student engagement and the likelihood of higher order, deep learning on the part of students (Biggs, 1999). According to Ives (2000), difficulties encountered by instructors of large classes include: involving students in active learning, personalizing the environment, working with diverse student needs and backgrounds, managing classroom disruptions and adapting one's teaching style to the large lecture situation.

Other problems of large classes include lack of structure, and little or no chance to discuss class material or interact with their classmates (Carbone & Greenberg, 1998). First year students (especially) are unprepared to deal with large class structure and procedures, and find themselves confused and uncomfortable (Ward & Jenkins, 1992). The time needed for grading and creating rubrics to reduce subjectivity in grading (Mckeachie, 1999). One of the most critical problems faced by instructors of large classes is that students feel isolated and are often anonymous to both the instructor and to one another (Svinicki & McKeachie, 2010). Students who perceive that they are anonymous often feel less

personal responsibility for learning, have decreased motivation to learn, and attend class less frequently (Cooper & Robinson, 2000). This isolation in large classes is seen to result in students taking a more passive role to learning, being less likely to participate in class activities and more likely to be distracted (Kirkwood, 2013). Some students respond to the anonymity and impersonal nature of large groups by becoming passive or "acting out in class," unlike they might in a small class setting (Carbone, 1999). The sheer size and anonymity of large classes seem to militate against the very elements that promote students' involvement and intellectual development, learning, and success (Macgregor et al., 2000).

3. Literature Review

We often think that learning occurs in proportion to class size. Research indicates that the learning environment, including faculty teaching methods, influences students' approach and strategies to learning (Weimer, 2010). Previous studies have shown that most students enter higher education environments with learning strategies constructed around the memorization of facts and the simple reproduction of knowledge, or surface learning (Exeter, Ameratunga, Ratima, Morton, Dickson, Hsu, & Jackson, 2010). The approaches that students take to carry out their academic work have been categorized in the research as either "deep" or "surface" learning approaches (Kerr, 2011). A surface learning approach tends to be characterized by memorization and reproduction of information in a mechanical manner, often driven by a focus on summative assessment and grades. A deep approach to learning encompasses a genuine, motivating interest in the subject, involving critical thought, interpretation, integration of new knowledge with prior understanding, application and transfer of knowledge to new contexts, and retention (Kerr, 2011).

The smaller the class size, the more students learn and interact with course material (Carpenter, 2006). Prior studies have shown that small classes provide more opportunities for feedback and discussion than large classes, as well as greater student satisfaction (Kirkwood, 2013; Gleason, Peters, Resman-Targoff, Karr, McBane, Kelley, Thomas, & Denetclaw, 2011). It does not suggest that class size is necessarily a correlate of student learning. According to Gleason et al. (2011), what counts is not the size of the class, but the quality of the teaching. Felder (1997) suggests that the key to effective instruction and student learning, regardless of class size, is engaging students in active learning. Carpenter (2006) argues that issues that confront teaching large classes are similar to those of teaching smaller classes as well.

Class size by itself is not a distinguishing feature of student performance, rather class size matters in relation to educational goals and the quality of the educational experience (McKeachie, 1980). Educational goals in higher education have moved beyond simple knowledge acquisition to promoting student engagement and higher order cognitive functions such as problem solving and critical thinking, which are characteristics of deep learning (McKeachie, 1980). Class size does matter in student participation and engagement in the class and this can affect the quality of student learning (Mulryan-Kyne, 2010; Cooper & Robinson, 2000). Previous studies have shown that the number of students in a class affects the quality of learning environment (Ehrenberg et al., 2001; Cuseo, 2007). The increased prevalence of large class and learning environments arguably adversely affects the quality of the educational experience along with student performance, motivation and engagement, which impacts upon the ability of students to gain valuable problem solving and critical thinking skills (Hornsby, Osman, & De Matos-Ala, 2013). The performance of those students who require interaction for motivation is especially likely to suffer when the amount and intensity of student-instructor interaction decreases, as tends to happen in large class environments (Exeter et al., 2010). Students tend to exhibit poor levels of engagement with material, less commitment to courses and lower levels of motivation in large classes (Mulryan-Kyne, 2010). This suggests that large classes are not learning environments conducive to establishing higher order cognitive skills (Hornsby & Osman, 2014). To maximise the quality of students' educational experience, learning environments should be constructed in ways that ensure that students' adaptive responses to the curriculum become congruent with the aims of the course (Meyers & Nulty, 2002; Biggs, 1996). These include the use of learning styles to inform on ways of designing learning activities, and the use of active learning strategies (Kerr, 2011).

Literature indicates that instruction in large classes yields the following: i) reduced student levels of active involvement in the learning process; ii) reduced frequency and quality of instructor interaction with and feedback to students; iii) reduced student motivation; iv) and reduced development of cognitive skills inside the classroom (Carbone & Greenberg, 1998; Cuseo, 2007). The findings of reduced levels of active involvement and interaction in large classes have implications for student success as student engagement has been strongly correlated with academic achievement, critical thinking, and student performance (Tinto, 1993). These implications are particularly important for students in their first year of University courses. These students are more likely to be enrolled in large, introductory courses, at the same time that they are most vulnerable to attrition. Other studies exploring quality of instruction indicate that instructor effectiveness, as measured by student evaluation, decreases with increasing class size (Cuseo, 2007). In addition, the pedagogical tools used by instructors are also found to be affected by class size, with the traditional lecture found to be

the dominant mode of instruction in large class settings (Cooper & Robinson, 2000; Cuseo, 2007). Despite these findings, it is cautioned that the skills and competency of the instructor, the teaching methods used and the course design are likely more important factors affecting student learning than class size alone (McKeachie, 1990; Biggs, 1999; Atkinson, 2010).

4. Traditional Lecture Approach

When academics are faced with large classes, they tend to present their lessons using the traditional lecture based format rather than engaging students in other teaching strategies that promote discussion and critical thinking (Exley & Dennick, 2004; Bligh, 2000). This transmission-based teaching is the dominant approach in most higher education (Exley & Dennick, 2004) and the most common teaching approach used in large classes (Mulryan-Kyne, 2010; Cuseo, 2007). The lecture approach has a number of advantages. Lectures present a minimum threat to students and can be used to communicate intrinsic interest on topics, convey large amounts of factual information to large groups (which is often economically viable), support instructor control, and foster learning by listening which is particularly advantageous for those who learn best in this manner (Cuseo, 2007).

However, it is the latter aspects of instructor-centeredness and passive learning that are most criticized (Felder, 1997). It is suggested that traditional transmissive pedagogical approaches, such as lecture contributes to less positive learning outcomes, such as poor retention and conceptual understanding of material (Weimer, 2010). According to De Caprariis, Barman, and Magee (2001), lecture leads to the ability to recall facts, but collaborative discussion produces higher level comprehension. Felder (1997) suggests that higher education goals involving understanding, application and evaluation of ideas, are not readily achieved in a passive learning environment. University lectures are less effective in presenting information and ineffective in encouraging higher order thinking skills (Biggs, 1999). Majority of student in higher education have different academic abilities and as such most of them struggle to learn materials presented to them through lectures (Laurillard, 2002). Lectures as a rule have little educational value that people learn by doing, not by watching and listening. Felder (1997) advises instructors to move away from the “wax museum-like” aspect of most large lectures and try a different approach that motivates students and encourages higher order thinking skills (Biggs, 1999). Other criticisms include lack of feedback to the instructor and student about student learning, inability to sustain student attention, poor recall of lecture material, and the assumption that all students learn at the same rate, with the same level of understanding, and use similar learning strategies (Laurillard, 2002). The challenge appears to be how to encourage the implementation of student-centred teaching methods in large enrolment courses.

For example, by varying student activities during a lecture session one can help renew attention, generate interest, provide opportunities for students to think, and provide useful feedback on student understanding. There are a number of movements in education that challenge the traditional pedagogy of teaching large classes in higher education. Instead of using the traditional passive view of learning, a more modern view of learning which is based on constructivism (Lipinge, 2013), where students are expected to be active in the learning process by participating in discussion and/or collaborative activities (Panitz, 1996; Fosnot, 1989). Since students have a range of learning styles and backgrounds, there is a need to develop teaching strategies that appeal to the range of students that participate in large classes. Hunt, Haidet, Coverdale, and Richards (2003) examined student performance in team learning methods; their findings show positive learning outcomes as compared to traditional lecture-based methods. Research on group-oriented discussion methods (Perkins & Saris, 2001; Yoder & Hochevar, 2005) has shown that collaborative team learning and student-led discussions not only produce favourable student performance outcomes, but also foster greater participation, self-confidence and leadership ability

5. Teaching Strategies in Large Classes

Delivering quality and value to a large class presents unique challenges. There are several approaches instructors can use to develop learning environments that support a broad range of students. Successfully teaching a large class involves setting ground rules, designing the syllabus, and using strategies to overcome student anonymity. It is therefore, crucial for faculty to identify viable strategies of instructions to make large-group teaching student-centred that creates opportunities for students to be active learners rather than passive recipients of information. Ives (2000) notes that there is no one best way to teach a large class, that instructors should consider their teaching style, the characteristics of their students, and the goals and objectives of the course they are teaching. If what is important is not the size of the class but the quality of teaching and learning that students receive, then, instructors need to re-think their teaching strategies, by delivering information through a variety of methods that offers students an opportunity to share what they know with peers and to learn from each other (Papo, 1999). Modifying large class teaching approaches requires a change in mindset, not only on the part of the faculty in breaking with tradition and taking the risk of implementing new strategies, but

also of students, in that more of the responsibility for learning lie with them. Lipinge (2013) argues that the success of teaching strategy will depend, in part, on student understanding and accepting the concept that learning is a collaborative experience between instructor and student.

Felder (1997) argues that instructors need to adopt teaching methods that are student-centred, such as active learning, discovery learning, inquiry-based learning, problem-based learning, case-based approaches, and just-in-time teaching which have been shown to enable a deep approach to learning on the part of students, and result in more positive learning outcomes (Prince, 2004; Weimer, 2010). Clearly, such teaching methods would be the preferred approach to ensure a high-quality learning experience for students. These methods motivate students and encourage higher order thinking skills (Biggs, 1999), because students are actively involved in-class activities, which will help them to develop a sense of community (Felder, 1997). In these in-class activities, the instructor might sometimes ask the students to write responses individually, sometimes to work in pairs or groups of three, and sometimes to work alone and then to form pairs and combine and improve their individual responses ("think-pair-share"). The more the instructor varies the methods, the more interesting the class tends to be. The benefit of these exercises is that they get students acting and reflecting, the only two ways by which human beings learn (Felder, 1997). Group exercises have the added benefit of giving students an opportunity to meet and work with one another. Advantages of using group work are promotion of communication skills by engaging students with class content and applying course information, building team-work skills, and giving students a structured setting to have a voice (Kirkwood, 2013; Mckeachie, 1999). It also provides additional forms of assessment and variety to lecture-focused classes, and lets students learn from each other.

6. Engage Students through Interactive Lecture

Lecturing is a time-honoured teaching technique that is an efficient method to present substantial amounts of content in class of any size. It is an efficient technique of sharing information with large numbers of students; however, this technique may result in students who listen passively. Large lecture halls impose physical and logistical constraints on what a instructor can do effectively. There are techniques instructors can employ to make large classes almost as effective as their smaller counterparts by keeping students interested and engaged. One of these techniques is to promote student engagement through interactive lecture, which can be used in lecture hall. An interactive lecture is an effortless way for instructors to intellectually engage and involve students as active participants in a lecture-based class. The instructor breaks the lecture at least once per class to have students participate in an in-class activity that lets them work directly with the material.

Teaching and learning is most effective as an interactive dialogue between students and an instructor who are at liberty to talk about the subject that is to probe it from different angles and at different depths to satisfy the learner's immediate needs. Given the short attention span of students (Bunce, Flens, & Neiles, 2010), breaking up a traditional lecture into smaller segments and incorporating active learning activities is helpful in maintaining overall engagement in course material (Lynch & Pappas, 2017). Breaking up the lecture not only provides format change to engage students, these activities allow students to immediately apply content and provide feedback to the instructor on student understanding (Miller & Rebelein, 2011). Research indicates that students experience fewer lapses in attention during "student-centred" activities such as demonstrations and opportunities to ask questions compared to a lecture (Briggs, 2014), and this improved attention carries through a lecture segment when such student-centred activities precede it, compared to vice versa. Prior studies (Felder, 1997; Wenzel, 1999; Halpern & Hakel, 2004) have shown that this type of interactive engagement leads to deeper learning and retention. Wenzel (1999) reviews research on college lectures and reports that the longer the lecture, the less of the material ended up in the students' notes. Wenzel reports that a class that used a think-pair-share technique for two-three minutes for every 12-18 minutes of lecture remembered more of the lecture material than the control class that heard the same lecture without the think-pair-share breaks.

Winestone and Millard (2012) propose that introducing active learning and formative assessment in large classes can be beneficial for both students and instructors in terms of their engagement and development. Winestone and Millard define active learning as "meaningful learning activities that require higher-order thinking and the development of skills over the mere transfer of information" and refer to formative assessment as "information communicated to a learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning". Their findings indicate that these methodologies can result in improved student engagement, retention of material, consolidation of understanding, and motivation. Weaver and Qi (2005) refer to the value of "active participation" in the college classroom being dependent upon student participation. In parallel to this research, an analysis of 50 large first year classes conducted by Prosser and Trigwell (2014) indicated that students are more likely to adopt surface approaches to study if their instructors are adopting less of a conceptual change and student-focused approach to teaching. Thus, Hornsby & Osman (2014) argue that a conceptual change and student-focused model is superior to an information transmission and

instructor-focused model when it comes to challenging students to think deeply, critically and creatively in large classes.

According to Felder (1997), students learn by doing, not by watching and listening.

Kirkwood (2013) concurs with Felder that students who are engaged in the learning process will retain course concepts. Making lectures interactive by including in-class activities can foster active student engagement and enhance the value of the lecture segments. Getting students involved, rather than sitting passively, increases student interest and perception of their own learning. In addition, Saroyan and Snell (1997) show that students rate a more interactive and student-centred lecturing style as more likely to imply more learning compared to more traditional, instructor-centred styles. In a survey of the economic education research literature, Miller and Rebelein (2011) report numerous empirical findings that demonstrate improved student learning and engagement in economics courses resulting from interactive pedagogies such as cooperative learning. They indicate that using techniques that allow all the students to participate, instead of having individual students answer questions when called upon, promotes student retention and learning of the material presented during lecture and it gives students practice in developing critical-thinking skills.

7. Engage Students through Active Learning Practices

An instructor may be daunted by the thought of incorporating some kind of active learning activities into his large classes (e.g. asking the students to discuss an issue in pairs or solve problems and share solutions). One of the biggest challenges of using any pedagogical technique that calls for interaction is to get all students to truly be engaged and participate. Active learning is an activity that engages students in doing more than passive listening. Active participation is one of the most effective ways to keep students engaged in large classes and it helps students increase understanding and memory (Mckeachie, 1999). Active learning is defined as 'anything course-related that all students in a class session are called upon to do other than watching, listening and taking note. Felder (1997) lists in-class activities and out of class group exercises for keeping students engaged in large classes. In-class activities capture and maintain student attention, such as thought-provoking question.

Active learning gives students the opportunity to reflect, analyze, synthesize, and communicate the material they learn during class (Mulryan-Kyne, 2010). The Prince (2004) review provided evidence showing that active learning improved academic achievement, interpersonal relations, self-esteem, and the perception of social support in undergraduate engineering students. Using a mixed methods approach that incorporates both lecture and active learning can be a powerful tool for increasing student engagement (Carpenter, 2006; Mulryan-Kyne, 2010). These active learning activities can build a warm supportive environment that help students feel safe, supported and valued. Instructors can use a variety of these techniques to engage their students in a wide array of contexts and with multiple learning goals. These mixtures of activities can be used to break up the lecture and engage with students. Several active leaning techniques are evaluated for suitability in a large class setting regarding classroom interactions and contextualized teaching. The following example offers suggestions for breaks and activities to make lectures more active and student-centred. These activities can be completed individually or in groups (Gleason et al., 2011):

Flipping the Class for Active Learning: In a "Flipped Classroom," student's initial exposure to content is shifted outside of the classroom via readings, instructional videos, individual or collaborative activities, or a combination of these. During class, rather than lecturing, all or a significant portion of the time is used for practice, application exercises, discussion-based activities, team-based learning, or other active learning techniques. Some preliminary assessment, such as an online quiz or brief assignment, may be used to gauge student understanding and tailor instructional plans prior to class. Students tend to be more engaged during class, thanks to interactive activities requiring critical thinking. Students tackle more challenging 'application' tasks during class, when the instructor is present to answer questions and provide guidance. In this process, students create, collaborate and learn at their own pace, and apply what they have learned at home in the classroom. Students can achieve better learning outcomes when learning actively compared to passively listening to lectures. This approach focuses explicitly on engaging both the student and the instructor.

Instructors are given the flexibility to engage in approach to teaching and learning that go beyond the traditional lecture models that they are often bound to, students respond differently, and learning is improved.

Just-In-Time Teaching: is a method for leveraging online activities and assessments of learning prior to class. So that instructors may diagnose what students understand (and don't), thereby tailoring face-to-face teaching to students' needs. It links students' responses to out-of-class web-based questions with in-class activities. Instructors post JiTT questions in a course management system and students respond online a few hours before class. Once submitted, instructor reviews students' responses to see what to focus on during the class period and uses the student responses to develop interactive in-class activities targeting learning gaps identified in the JiTT responses. JiTT pedagogy is an effective teaching practice that is grounded in learning, which emphasizes active student engagement in the learning

process. Course-based research in a number of disciplines has shown that JiTT has a positive impact on student learning outcomes, while at the same time increasing in-class teaching efficiency and effectiveness. Nilson (2010) highlights JiTT as an effective "inquiry-guided learning" teaching practice that can transform lecture-based courses into more interactive, collaborative, problem-based learning experiences and increase student accountability for learning. JiTT enhances connections between students and instructors, both through personal feedback on JiTT responses and classroom activities that are informed by those responses.

Concept maps: can be used individually or collaboratively to reinforce concepts learned out of class and build connections between various topics. Students map out how concepts, ideas, or theories are thematically related in a visual manner. Any gaps can be useful inspiration for discussions either at a group or class level.

One-minute paper: asks students to stop what they are doing and produce a written response in one minute. The instructor asks students at intervals to write down the "muddiest" part of the lecture, and then use some of the questions in the next class. This technique can be used to collect feedback on understanding by asking them to identify what they thought the most confusing point was or to voice a question.

Think-Pair-Share: takes a central concept presented in the out-of-class material, or a particularly controversial quiz question from a prior assessment, and have students reflect on it individually and then discuss it further. Think phase: students work independently and flesh out their thoughts/arguments and may write their thoughts down. Pair phase: students discuss their response with a partner. Share phase: the instructor elicits responses from all members of the class and begins to engage students in a wider discussion demonstrating the many different perspectives. This is a great way to motivate students and promote higher-level thinking. The technique can be introduced at any time during a class to address questions or solve problems or to create variety in a class presentation.

Role play: can be facilitated in class to demonstrate varying perspectives on a topic. Role playing activities put the student in the position of a relevant decision maker forcing them to apply the content to determine a policy or solve a problem. This often calls upon higher order thinking skills and the synthesis of ideas and when students do this in a group, negotiation skills become important as well. After the role play, the instructor concludes with a larger discussion to see what approaches the groups or individual members took.

Case Studies: students review a case study concerning a specific, real-life problem or scenario. Applying what they learned in the out-of-class, the group discusses how they would tackle the problem and what solution they would prepare. Each group can then debrief with the rest of the class and present their solution. Case Studies are particularly useful for applying knowledge, problem-solving or showing how experts solve problems.

Effective Assessment in Large Classes

Assessment in large classes presents a unique challenge for instructors, for example, how to promote assessment that encourages deep learning and avoids surface learning. Ives (2000) lists some of the challenges of assessing students in large classes as (i) managing the volume of marking and coordinating the staff involved in marking assignments, examination scripts, recording tests and minimizing plagiarism; (ii) providing high quality, individual feedback to students can be much reduced in large classes; and (iii) fairly assessing a diverse mix of students. Although many interactive techniques require students to produce some output that might be graded, however, not everything that students produce must be graded. Grading provides students with stronger incentives to participate and respond accurately, however, it requires more time and effort on the part of the instructor. Quick, frequent, formative assessments help students to focus on areas they need work on. Activities need not be graded for students to receive feedback that could be accomplished through the task itself or follow up discussion. In general, assessment can have high stakes for students (where the content must be corrected for full credit), low stakes (where credit is based more on participation and effort), or no stakes (where students receive feedback but nothing is collected). The question is how to develop assessment in large class that is reliable, fair and standard across different markers. This can be achieved by using rubric to develop clear assessment criteria that explains the assessment tasks. The rubric assessment criteria make it easy to grade student work in a standardised format and it speeds up the marking process and creates greater reliability across different markers (White, 2012).

8. Using Rubric for Assessment in Large Classes

Rubrics are developed to assist faculty in measuring engagement of students with the learning outcomes and aims of teaching (Campbell, 2005). A rubric is a tool that has the potential for helping instructors to formatively assess students' performance during the teaching/learning process by clearly establishing the standards and quality expectations (Seymour, 2005). It assists in customizing the student feedback: what a student has done well; what weaknesses exist; and how or what might be done to correct or improve the performance. Information obtained from the summative use of rubrics can be utilized to formatively report student progress toward the agreed upon learning outcomes. A rubric con-

sists of a set of criteria and marks or grade associated with these criteria (Seymour, 2005). It provides a clear guide as to how students' work will be assessed and assists the marker to make consistent and reliable judgments about the quality of student work. Rubrics are commonly presented in the form of a matrix that includes: marking criteria—the elements that describe the extent of proficiency required for a given task, that the marker will consider when judging a piece of work. Grading standards—descriptive statements about the level of each criterion, often expressed on a scale (such as Distinction, Credit, Pass, Fail, or a number score).

Students value rubrics due to the description of the evaluation criteria for a task and the ability to receive feedback for future improvement. According to Reddy and Andrade (2010) rubrics serve as a guide for students to accomplish their tasks incorporating deep learning strategies. Students perceive that the grading is transparent and fair when they receive their detailed grading using rubric tool (Andrade & Du, 2007). While instructors consider consistency, reliability and efficiency of grading as the major value in using the rubrics tool (Campbell, 2005). Students can use it in developing, revising and judging the quality of their own work, while instructors can use it to assess students' performance either analytically or holistically (Mertler, 2001). If properly designed, rubrics can have many benefits for learning and teaching in a large class environment. One of the main benefits of using rubric is that it helps to ensure that the assessment of engagement with teaching material is carried out in a clear, open and fair manner. Rubrics can assist with consistent and uniform grading of engagement, whether it be by formal summative assessment or otherwise. By clearly aligning any rubric to the learning outcomes of the mode of study, any member of staff that carry out grading understand properly how to assess. It can also be made clearer to students throughout their studies that assessment will be marked against specific criteria (Huba & Freed, 2000).

Rubric makes it easy to grade student work in a standardised format and it speeds up the marking process and creates greater reliability across different markers (White, 2012). The most important function of a rubric, however, is in providing both formative (ongoing) and summative (after marking) feedback to students and feedback to staff on students' learning and thus the effect of their teaching (Huba & Freed, 2000). Appropriate feedback can be given at an individual task level, assignment level and as well as at an overall course level (Hepplestone, Holden, Irwin, Parkin, & Thorpe, 2011). The use of rubric enables students to hand in work that is better in quality than they might otherwise have done (Stevens & Levi, 2005). Students do not have to guess or infer what the instructor wants and instructors are forced to articulate and if necessary quantify the most valued outcomes of students' learning (Stevens & Levi, 2005). The breakdown of assessment grades in a database management course which the author designed is used here as a demonstration of using rubrics for assessment in large class. The learning outcomes were graded qualitatively in the first instance and then a percentage awarded according to how well the student performance matched that grade. Table 1 shows the breakdown of the assessment grades and table 2 shows rubrics for mid-term test respectively.

9. Conclusion

Evidence from literature indicates that issues that confront teaching large classes are similar to those of teaching smaller classes as well. Teaching large classes represent particular challenges to instructors and student learning in higher education. This study suggests merit in using careful planning and active learning activities in teaching to complement the traditional lecture in large class teaching. It requires the instructor to make the necessary logistical arrangements far enough in advance, provide plenty of active learning experiences in the classroom. By varying student activities during the lecture session, one can help renew attention, generate interest, and provide opportunities for students to think and feedback on student understanding. The incorporation of learning activities in large classes can come close to being as educationally rewarding as small classes. The literature review of strategies for teaching large classes shows that active learning such as those discussed above are more effective than the traditional lecturing format. Research shows that most students enjoy a blend that includes at least some component of active learning/participation with traditional lecture, this shows that most students prefer to be active in their learning process. This confirms the importance of including active learning activities in the lectures whenever possible by faculty tasked with teaching large classes. The successful incorporation of collaborative learning into the traditional lecture may also be the most economical way of improving participation in large classes.

Table 1. Breakdown of assessment grades

Excellent	Very good	Good	Marginal	Fail
A+ = 97-100	B+ = 82-85	C+ = 68-71	D+ = 50-54	F = 0-39
A = 91-96	B = 76-81	C = 60-67	D = 45-49	
A- = 86-90	B- = 72-75	C- = 55-59	D- = 40-44	

Table 2. Rubric for mid-term test

Criteria	Excellent	Very good	Good	Marginal	Fail
Database system concepts and architectures	Demonstrate sound knowledge of most materials covered, able to describe all concepts of information systems and to identify relationship between difference concepts	Able to describe various major concepts of information systems with thorough comprehension of each and able to discriminate between different concepts	Able to recall and describe some important concepts of Information systems and able to show some linkages between different concepts	Able to recall major concepts of information systems with simple description, with ability to grasp linkages between a small number of concepts	Unable to recall any concepts of database system
Explain the impact of developing and using information systems in business	Able to explain impact of information systems from various perspectives and how this determines the use of database systems in business settings based on sound knowledge	Able to explain information systems' impacts in the various aspects, with well-rounded knowledge in business settings	Able to explain some of the information systems' impacts in some aspects, with some knowledge in business settings	Able to explain a few important impacts of information systems, with knowledge limited in business settings	Unable to explain the impacts of information systems in business settings
Using SQL to extract information from datasets	Ability to construct database schemas in SQL correctly, and to make updates and queries to database according to all specifications.	Ability to construct database schemas in SQL mostly correctly, and to make updates and queries to the database according to most of the specifications.	Ability to construct database schemas in SQL correctly for average questions, and to make updates and queries to the database according to some of the specifications	Able to construct some database schemas in SQL for simple questions, and to make some updates and queries to the database	Unable to construct schemas in SQL or make any updates or queries to the database

By focusing on student engagement and remodelling classroom teaching in a way that meets higher learning objectives improves student learning and retention, increases student involvement in the learning process. Adapting assessment strategies to promote this, it is possible to overcome the challenges posed by large class environments into opportunities for effective student learning. The use of rubric as assessment strategy provides instructors with an effective means of learning-centred feedback and evaluation of student work. As instructional tools, rubrics enable students to gauge the strengths and weaknesses of their work and learning. As assessment tools, rubrics enable faculty to provide detailed and informative evaluations of students' work. The insights offered in this paper not only help in addressing the conceptual issues of teaching in a large class, but also provides practical insights for those instructors faced with teaching and supporting large-class environments in higher education.

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