Teaching and assessment in large classes

Introduction

Despite the extensive research of recent years into teaching strategies for large classes, its implementation remains limited (Biggs, 1999). One of the most significant problems is the persistence with teaching, administrative and organisational approaches that have been successful in small classes, but that are incompatible for use with large groups. Various authors, such as Biggs (1999) and McKeachie (1999) have highlighted a number of teaching techniques that can be utilised across a broad span of disciplines. The most common instructional concerns in teaching large classes include:

- Stimulating active learning and higher order thinking;
- Maintaining interest and varying teaching strategies;
- Selecting the appropriate pace and content for lectures;
- 'Performing' versus teaching;
- Developing valid and reliable assessment that is also manageable;
- Coordinating and managing assessment and feedback.

The following sections include a review of the literature and responses to the University of Queensland Survey. They discuss the aforementioned instructional problems faced by the teachers of large classes and suggest strategies for improving the quality of teaching and assessment with large groups of students.

Teaching in large classes

There has been extensive scholarly literature published on teaching large classes across various mediums, including books and web-sites. The vast majority of this research pertains to large lecture classes, which remains the primary teaching environment for on-campus courses, despite the rapid growth of on-line teaching methods. The importance of ensuring academics maintain effective lecturing skills will continue, because lecturing remains one of the most economical means of inculcating information, with only one staff member required per several hundred students.

First Year Teaching: General Tips

The vast majority of large university courses involve first year students, which is an educational culture significantly departed from that experienced at high school. Students graduate from an environment of rigid structure where their progress is closely monitored, to one of significantly greater freedom over timetables, deadlines, work schedules and even whether or not they attend classes.

Although many first year students adapt to these new circumstances, it is advisable that academics employ various teaching strategies designed to facilitate the adjustment for students struggling to come to terms with the university experience (McKeachie, 1999). First year students particularly benefit from being given feedback on their progress at an early stage in the course, whether in the form of assignments, exams or laboratory/tutorial assessments. In ensuring the standardisation of this process in large classes, the subject coordinator needs to provide markers with a system of marking and an avenue for comparing results before they have been finalised. An important component of promoting the uniformity of marking is ensuring that markers are informed of lecture content, preferably by their attendance, and receive complimentary copies of all course materials, including textbooks and manuals.[1]

The first lecture in a course is invariably the most important, because the vast majority of students make an effort to attend and make both conscious and unconscious judgments of the lecturer and the course. At the first lecture, especially with first year units, it is crucial that the lecturer explains the relevance of the course to the students' degree programs, delineate the lecture program, and clarify the purpose of the lectures, as well as tutorials and laboratories. It is also imperative that issues pertaining to assessment are discussed in this lecture, including rules about attendance, methods of assessment and the standards required in assignments and tutorial/laboratory activities. Godfrey (1998) suggests that lecturers can enhance their approachability, which is a common problem in large courses, by introducing themselves, sharing their backgrounds, qualifications and why they find they recommend the subject.[2]

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[1] For more information on these issues, see Administration and management of large classes.
[2] For a more details set of ideas and teaching tips, see the Teaching Guidelines.

Lectures and active learning

Traditional lecturing methods have proved to be problematic in teaching large classes because:

- The attention spans of students are difficult to maintain due to prolonged inactivity;
- Diminished flexibility within the curriculum;
- More difficulty in stimulating higher-level thinking (such as analysis, synthesis, relating key concepts, problem-solving, application and evaluation of ideas).

The deficiency of lectures in stimulating higher-order cognition was studied as early as 1953. Bloom (1953) found that students spent an average of 1% of their time in lectures solving mental problems and synthesising information, compared to 60% of their time in irrelevant or passive thoughts. Although students in traditional lectures often take copious notes, they still only record approximately one-third of the ideas presented by their lecturer (Biggs, 1999). Also, research has demonstrated that the process of note-taking is a passive, low-level activity requiring little concentration or understanding of concepts and, therefore, students are not remembering or comprehending much of the content either in taking the notes or in their revision. The provision of pre-prepared lecture notes fails to address this problem, unless they remain brief, with sufficient space to allow students to synthesise information by producing a personalized set of notes.[3] Research has revealed that lectures can be efficient methods of inculcating knowledge, provided that students are given rehearsal tasks to consolidate the retention of information (Morgan, Whorton & Gunsalus, 2000). But even with such strategies, traditional lectures still demand only low levels of cognitive processing because students remain passive throughout lectures. The objective of stimulating higher-order thinking is only achieveable when students are engaged in classes, such as in discussion groups, rather than conventional lectures (Ward & Jenkins, 1992).

Making lectures more effective

Lecturing large groups is an entrenched part of the university culture, and its economy and efficient use of resources will ensure its continued use despite its limitations as a teaching tool. Various methods can be utilised in lectures to actively engage students and stimulate their higher-order thinking, such as the employment of class discussion, visual and multimedia aids, handouts or written and small group activities (McKeachie, 1999; Nance & Nance, 1990). These strategies function to vary the presentation of lectures, enhance comprehension and engage students in problem solving. A study by Lopp (1999) found that mathematics faculties that relied upon more active learning strategies (such as

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[3] For more ideas see the Planning and Teaching guidelines.

cooperative group activities and regular use of board-work demonstrations), rather than traditional lectures and standard problem-question setting, had higher retention and pass rates than those that relied on the reverse.

The increasing use of information and communication technology (such as WebCT, Microsoft PowerPoint) has enhanced the flexibility of lecturing to large classes. But respondents to the University of Queensland Survey (2001) had varying perspectives on the efficacy of technology as a teaching tool in large lectures. Although many academics maintained that PowerPoint was their most useful teaching instrument, others insisted that it imposed a rigidity and hierarchy in lectures that limited student-teacher interactions, reinforced their image of unapproachability, and failed to address the problem of student passivity. These mixed results suggest that academics need to consider the suitability and tailor the use of technology according to course content.

Waugh and Waugh (1999) argue that the questionable efficacy of large lectures is related to their incorrect use. Waugh and Waugh analysed student comments and responses on evaluation forms across several large classes taught as part of a teacher education program and their results suggested that the larger the class, the more motivating and effective the lectures can be. There is support for this observation, which suggests that as group size decreases, the efficacy of lectures diminishes because other teaching techniques become more appropriate means of imparting knowledge (Crittenden, Norr & LeBailly, 1975). But Waugh and Waugh suggest that lectures are most effective when they do not involve the provision of detailed content as their primary objective. Rather, they advocate the large class lecture as an avenue of supplying students with an atmosphere conducive to learning. This involves providing knowledge about sources of information, the availability of resources, motivation, a desire to question, and inspiration about researching various subjects further. Waugh and Waugh suggest that certain characteristics are necessary to the effective teaching of large classes of students. These include:

- A relaxed atmosphere;
- Compelling, "real-world" content;
- Light-heartedness/humour;
- Demonstrated concern for students' progress;
- Well-timed breaks;
- Relevant illustrations and examples;
- Stimulating and entertaining delivery;
- Accompanying tutorial system.

The findings of Waugh and Waugh also supported other research that has observed that the efficacy of large lectures is dependent on an accompanying continuous and related system of tutorials.

A case study using teaching technology

Simon Avenell (2001) from Murdoch University has described his utilisation of technology in delivering lectures to large groups of students. His use of PowerPoint in conjunction with RealAudio (a software package for delivering audio recordings over the web) has allowed him to provide students with virtual 'in-class' experiences via the Internet at the time and place of their convenience. Avenell makes in-class recordings of lectures and workshops and, after editing them, saves them into a RealAudio file that is loaded onto the class web-site. Students are able to then access the site and download both the audio and visual files. By playing them simultaneously students can reproduce the presentation. The primary advantage of such methods of on-line learning is that students have the flexibility to view the presentations repeatedly and to replay and concentrate on difficult sections. The programs are easy to access and available with already existing university resources. The initial investment of time to establish the programs is quite high, especially in relation to mastering the software and the conducting of rehearsals in the lecture theatre. Furthermore, Avenell reports that preparation of the PowerPoint presentation can take between 2 to 10 hours for a 50-minute lecture (depending on the amount of text, notation and diagrams to be included). The use of PowerPoint can be particularly beneficial for technical courses that require diagrams, because it is a more precise method of presenting graphics as it eliminates human error. Perhaps the most positive aspect of using technology as a teaching tool is that lecturers model the benefits of using information technology and improve students' capacity to interact with technology, which is a fundamental skill required of university education.

Performing versus teaching

The increasing emphasis on students as clients in higher education has resulted in many academics transferring the focus of their lectures from the content to the entertainment value (Gibbs, Lucas & Simonite, 1996; Ward & Jenkins, 1992). The problem is that although these performances often elicit positive feedback from students, being a good performer is not necessarily synonymous with effective teaching (Gibbs et al, 1996). Nevertheless, there is support within the higher education industry for the notion that a lecture to a large class is a performance. John Lee (1997), who has been identified as a proficient teacher of large classes at the University of Sydney, draws an analogy between the lecture theatre and the movie cinema. Lee uses various strategies whilst lecturing to maintain students' attention, including colourful displays, audio-visual tools, movement around the teaching venue and short-time frames. This involves the use of technology, but also more simple teaching tools, such as drama, costumes, cartoons, debates, news footage and examples from his own and others' experience.

There are many other techniques that have been successful in improving the quality of teaching in large groups, including buzz groups, fishbowls and minute-papers (McKeachie, 1999; Biggs, 1999; Howe & Godfrey, 1978). Habeshaw (1995) maintains that effective teaching of large groups should employ the seven principles outlined by the *Johnson Foundation* for good practice in undergraduate

education. These are:

1. Encourage student-teacher interaction.
2. Stimulate interaction amongst students.
3. Promote active learning.
4. Give prompt feedback.
5. Emphasise time *on task.*
6. Communicate high expectations.
7. Respect diverse talents and ways of learning.

Habeshaw argues these principles can be employed through the use of 'ice-breakers', reflective exercises, 'instant questionnaires', problem-solving sessions, short but regular tests, and the establishment of study and special interest groups.

Pace and content of lectures – dealing with student diversity

The increased diversity of student backgrounds and abilities that has accompanied increases in class size is magnified by large student numbers (Ward & Jenkins, 1992; University of Queensland survey, 2001). Large first-year core subjects often involve students from various disciplines, and with different levels of ability and background knowledge (Harcum, 1992). But although the extent of prior knowledge is an important determinate of academic performance, teaching methods have the capacity to ameliorate its effect. Blake (1990) studied the performance of undergraduate students from different academic backgrounds (including engineering, mathematics and science) completing an introductory course in organizational behaviour. He found that when teaching methods such as small group work, experimental learning exercises and case solutions were employed, the effects of academic background on student performance were negated. Habeshaw (1995) advises that the most efficient strategy for teaching a diverse student population, is to limit lectures to the core material of the subject and, thereby, allow students to apply the material to their own disciplines.

Assessment in large classes

It has already been established that student numbers limit the teaching methods available to academics, but assessment methods are similarly circumscribed by class size. Responses to the recent University of Queensland survey (2001) and the existing educational literature have identified various assessment issues associated with large classes. They include:

- Excessive marking loads;
- The circumscription of valid assessment by the necessity of manageability;
- Giving sufficient and prompt feedback;
- Monitoring cheating and plagiarism;
- Maintaining quality and consistency of marking;
- Lack of higher order thinking examined by certain assessment tools.

Although these issues can be problems in assessment for any class size, they are exacerbated in large classes because of the additional limitation and strain on resources. Solving certain logistical problems can create other difficulties. For example, lessening the marking load by increasing the number of markers can undermine quality control by making it more difficult to maintain marking consistency or identify plagiarism, as markers view only a restricted number of exams. Course-coordinators can overcome some of these problems by ensuring communication between markers and that the marking scheme is universally applied with strategies such as cross-marking.

Assessment Principles

The principles of good assessment in large classes are the same that apply in any circumstance. Similarly, students expect quality, considered and fair assessment irrespective of the size of their class. Good assessment is valid, reliable, and appropriate for its purpose, whether it be to enable certification or classification of students' achievements or to facilitate learning and understanding. An assessment tool is valid if it actually assesses that which it is designed to assess, and a reliable instrument produces consistent results. From a public relations perspective and to minimize complaints, it is imperative that assessment procedures possess face validity, where they appear to both examiners and examinees to provide accurate assessment.

Because of its face validity, authentic assessment is a popular means of measuring student ability. *Authentic* assessment entails utilising tasks as closely related as possible to those that would be involved in the profession to which the degree is orientated (Baron and Boschee, 1995; Wiggins, 1998). For example, in a medical course authentic assessment would involve a student diagnosing and prescribing the management of a real patient, whereas non-authentic assessment would involve specifying how to diagnose and treat a particular disease in a more abstract format. But the reality is that although authentic assessment has a high level of face validity, it may possess less reliability and, therefore, less predictive validity. This is because implementing authentic assessment procedures is difficult with large numbers of students. The validity and reliability of authentic assessment is confounded by the increased likelihood of the presence of contextual information. Although this extraneous information may appear to be irrelevant, it can function to either assist or distract the student from the task at hand. Also, when large numbers of students are present it is difficult to standardize the experience for all students. For example, in the medical case above, it would be impossible to have several hundred students interviewing the same patient. Furthermore, irrespective of the number of repeat interviews, the patient's behaviour is unlikely to remain consistent throughout.

It has been common in the educational lexicon to distinguish between assessment for certification (summative assessment) and assessment for learning (formative assessment) (Rowntree, 1987; Scriven, 1967). The obvious distinction is that

assessment for certification needs to be clearly related to a set of outcomes (such as the learning objectives of a subject), while assessment for learning needs to be closely integrated into the teaching and learning program for the subject. Nevertheless, in practice, assessment often fulfils both roles (Brown, 1999).

Assessment and learning

The assessment system used by academics needs to be viewed as part of the teaching process, because it is now widely accepted that student expectations of assessment have a strong influence on the content, depth and nature of their learning (Biggs, 1999; Marton and Säljö, 1976a; Marton and Säljö, 1976b; Newble and Jaeger, 1983). When used appropriately, assessment can help to drive and enhance students' learning. In this regard it is important to note that it is student expectations of the nature of the assessment that impacts on learning. Thus, it is not sufficient for assessment to accurately reflect the goals of the subject and assess understanding, students must believe that the assessment will do so. This may be achieved by simply informing the students of the validity of the assessment instrument, though it is more effective for students to do some sample assessment or to view examples of good student work from previous offerings of the subject.

Assessment is particularly effective when it incorporates examination of higher level thinking. McKeachie (1999) uses a course in philosophy to extrapolate several examples of incorporating such criteria into assessment. He describes a situation where an education lecturer altered his philosophy of education examination from requiring students to 'compare and contrast' two philosophies to one that called for analysis, synthesis and application of knowledge to a particular situation. The lecturer was frustrated with the original question because it encouraged the memorisation and regurgitation of facts about philosophers covered in lectures. The new examination that he devised used videotaped recordings of a teacher confronting difficult classroom problems that had philosophical dimensions to them. The students were then given a much more open-ended question and asked to use their knowledge of philosophy to comment on the situation and advise about future teaching strategies.
The question was resurrected perennially, though its longevity was assured by altering the video extract to focus on different classroom scenarios that offered philosophical insights.

Valid and manageable assessment with large classes

The task of ensuring valid assessment is much more difficult with large classes because of the marking load involved (McKeachie, 1999; Stefani, 1998). It is a problem that is applicable whether the function of the assessment is to facilitate learning via feedback, or to classify students via grading. For example, an Economics lecturer in the University of Queensland Survey (2001) reported that weekly tutorial papers were an effective means of providing continuous assessment of student performance, but it becomes unmanageable with large

groups. A Business lecturer advocates a realistic approach to large classes, which involves suspending formal continuous assessment. Gibbs (1992a) argues that assessment in large classes can be made to be manageable without undermining the quality of learning and he suggests a number of strategies:

- Front-ending assessment – that is, investing more time into devising assessment exercises and preparing students for them, in order to minimise problems that could arise later. This may involve providing comprehensive instructions for assignments, clarifying in detail the assessment criteria or providing practice assessment (Gibbs, 1992a).[4]
- Spending more class time on strategies to approach assessment.
- Using self- and peer-assessment to devolve some of the work to students that would otherwise be done by teaching staff. This approach would have to be promoted as providing a learning experience.
- Group assessments to reduce the number of pieces of work to be marked.
- "Mechanising" or automating assessment.
- Reducing the number of assessment items or the amount of feedback offered. This would have to be done carefully and strategically to minimise any adverse impact or reaction.

Self-and peer-assessment

Self and peer assessment is becoming increasingly pervasive in higher education, especially in the context of group work as larger classes strain academic resources (Isaacs, 1999). Self-assessment reduces the marking load because it ensures a higher quality of work is submitted, thereby minimising the amount of time expended on marking and feedback. Boud (1995) is a strong advocate of self-assessment as a tool to enhance learning by providing formative feedback and enhancing meta-cognition (thinking about how one learns – an important tool in deep learning). There are problems involved in self-assessment for grading purposes pertaining to their validity and reliability (Boud, 1995; Orsmond, Merry and Reiling, 1997). If self-assessment is utlised for the purposes of grading, it is imperative to employ peer or staff cross-marking to ensure the validity of the results. Self-assessment should also be confined to certain limited objectives such as ascertaining whether all of the required components of an answer are present, or the articulation of very transparent assessment criteria and standards, possibly accompanied by examples of work of varying standards (Hanrahan and Isaacs, 2001). In this regard, self-assessment can decrease the marking load of academics and provide students with a positive learning experience by compelling them to examine their work from the perspective of a marker as well as a participant.

In a similar fashion to self-assessment, peer-assessment can provide useful learning experiences for students at the same time as reducing the marking load of staff (Hanrahan and Isaacs, 2001). Peer assessment allows students to view

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[4] see http://www.tedi.uq.edu.au/teaching/assessment/index.html

the work of their peers and contemplate the merits of other ways of approaching the assessment, as well as the importance of adherence to the marking criteria. It is particularly advantageous when it requires students to provide feedback, as this ensures that they carefully consider the merits and deficiencies of a piece of work. Falchikov and Goldfinch (2000) recently undertook a meta-analysis of 48 studies of peer assessment. They found that global peer assessments premised on transparent criteria conformed more closely to teacher assessments than did assessments along a number of separate dimensions. But although global assessments may be more accurate than analytical assessment on various criteria, the reverse is true when it comes to the quality of feedback. Therefore, when entertaining peer assessment is should be noted that there is an inverse relationship between reliability and validity for certification purposes, and efficacy for learning purposes.

Feedback on progress and peer-assessment

The importance of feedback to accompany grades on written assignments has been established since early last century (McClusky, 1934). Time and resource constraints have increasingly encroached on the capacity of lecturers to provide such feedback, especially with respect to large classes. McKeachie (1999) points out that feedback on writing, presentation and problem solving skills can be given both formally and informally by peers, as well as markers.

Group Assessments

The most obvious advantage of g*roup-based* assessment is that it significantly reduces the marking load if the group submits only one piece of assessable work (Isaacs, 1999). This benefit does not accrue when students undertake a task in a group, but submit individual assessment items. Such a process has definite learning advantages for the students, but no workload benefit for the staff required for marking. The gains of reduced marking can be outweighed by the potential consumption of staff resources in the efforts needed to assist students to interact effectively and, possibly, in helping students to manage troublesome group members.

Automating assessment

Automated assessment can involve either of two processes:

- Automated marking systems, though it should be noted that there are limitations on what assessment items can be marked with such systems;[5]

- Semi-automated feedback systems, where comments are selected from a database.

Computer marking has significantly reduced marking loads with a limited range of assessment items. The most common form of assessment in large classes is through the avenue of the multiple-choice exam, because of the reduction of the marking load enabled by automated marking (University of Queensland Survey, 2001). The major investment of resources in developing multiple choice exams is in the time taken to write valid questions (Ebel, 1972; Isaacs, 1994), though often useful sets of items can be obtained from text publishers and other sources (Brown, 1999). Time spent devising exams can also be minimised by storing already developed questions in well-indexed question banks for possible future use. If the bank is sufficiently extensive, making it accessible to students can function to guide their study by encouraging the development of strategies to approach the questions, rather than memorise the answers.

Though multiple-choice examinations are favoured by numerous academics, many question their pedagogical value and criticise them for promoting rote learning. These criticisms have foundation as multiple-choice examinations do assess learning at a much more superficial level than other forms of assessment (Scouller, 1998; Scouller and Prosser, 1994). In fact, the employment of deep learning strategies can undermine performance on a multiple-choice exam, where there is a relationship between rote learning and achievement. In contrast, essay assessment examines higher levels of cognitive processing, is perceived to do so by students and has an inverse relationship between performance and surface learning strategies. Many authors defend the efficacy of multiple choice exams, maintaining that it is poorly constructed tests that engender rote learning (Biggs, 1996; Biggs, 1999; Brown, 1999; Rowntree, 1987). Other authors argue that the problem is the image of multiple-choice exams, which are perceived by students to examine superficial knowledge and, therefore, encourage surface learning strategies (Marton and Säljö, 1976a; Marton and Säljö, 1976b; Newble and Jaeger, 1983). These authors suggest that the effectiveness of multiple-choice exams in examining deep learning may depend on convincing students that this is their objective, such as by providing samples in class that do so.

On-line testing is an increasingly popular means of reducing marking loads, though it cannot be executed with current technology without it being insecure, or the significant investment of resources to either manage a large class in smaller sections or to allow simultaneous examination. The appeal of such examinations

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[5] see Bull and Stephens, 1999 for reports of two successful uses of Questionmark software in the UK – one for formative assessment and one for summative assessment

is that they allow students to take the tests on their own computers, but this causes problems pertaining to the monitoring of cheating and hacking, which can bring the validity of the results into question. The security of the testing process can be enhanced if the students are examined in a university computer laboratory, though this requires either sufficient resources for simultaneous examination or testing in sections. Testing in sections would require either the sequestering of students who have already taken the test or the development of parallel forms of the test for the various sections.

Assessing less, but in a more carefully targeted way

Both Gibbs (1992a) and McKeachie (1999) argue that formal assessment can be minimised by replacing it with informal methods of assessment, provided that they are targeted at the course objectives. For example, McKeachie advocates the use of tools, such as non-graded tests, papers or presentations. He is also a strong proponent of self-assessment, not just as a tool for enhancing performance within a course, but also as a necessary life-skill. Hanrahan (1997) also advocates self-assessment as a crucial tool in promoting within students a greater sense of control, self-awareness and encouraging reflective practice.

Plagiarism and cheating

Plagiarism and cheating are made more problematic in large classes, where the resources of markers are more strained, but discussion of this problem is beyond the scope of this review.[6]

Quality assurance and quality control of assessment

Methods of ensuring quality assurance and quality control are essential when assessment is used for the purposes of certification. Students have a reasonable expectation that their assessment results accurately reflect their level of achievement in a particular subject or course of study. There is an onus on course coordinators to demonstrate that the assessment has 'constructive alignment', or accurately targets the objectives of the course (Biggs, 1999). This includes ensuring that marking and grading schemes are constructed in a fashion that guarantees their validity and reliability, including the use of cross-marking where multiple markers are employed (Rowntree, 1987).

Many academics favour the standardisation of results using the bell curve to maintain the quality of graduates, especially when dealing with large groups of students (McKeachie, 1999). This process involves assessing students' ability relative to the other students taking a particular test or course, rather than to criteria based levels of achievement. There are a number of criticisms of grading

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[6] For further information on this topic refer to the following websites: http://www.plagiarism.org/ and http://www.lgu.ac.uk/deliberations/forum/plagiarism.html

relative achievement, including that it is antithetical to cooperative learning as assisting another student can have consequences for a student's grade. Standardised grades also, by definition, only define a student's ability relative to their peers, not their ability in an absolute sense. The articulation of the criteria necessary for achieving a pass mark is undoubtedly a fairer system of grading (McKeachie, 1999).[7]

More general resources – books about assessment in higher education

There is an extensive range of resources on assessment in higher education that should be consulted for further and more specific information than that contained in this report. Nightingale, te Wiata, Toohey, Ryan, Hughes, and Magin (1996) have written a book of case studies with accompanying essays about assessment in universities. The case studies are derived from Australasian universities and involve assessment techniques for assessing higher-order tasks, including critical thinking and communication. Although it does not specifically address assessment in large classes, many of the techniques are relevant to these environments. Miller, Imrie and Cox (1998) also examine similar themes with case studies drawn principally from the UK, Hong Kong and Australasian universities. Gibbs (1992a) has written the fourth volume in the five volume series *Teaching More Students*, which deals specifically with assessment in large classes and is designed to function as a resource guide in the provision of ideas for a teaching workshop. Habeshaw, Gibbs and Habeshaw (1993) have produced a similar work on behalf of the same organisation (the British Polytechnics and Colleges Funding Council) but aimed at classes of various sizes. Although many of these works should be regarded as useful resources, they should be viewed with caution because there is very little underlying pedagogical rationale. Edwards and Knight (1995) have produced an innovative book of articles focussing on the implementation of competency-based assessment in higher education. This is a controversial concept because the assessment of competencies is most commonly associated with technical and vocational education. Nevertheless, the definition of criteria or competencies to be assessed is a necessary preliminary step in developing assessment strategies for dealing with large numbers of students. Knight (1995) and Brown and Glasner (1999) have also produced useful works on approaches to assessment, though neither of them explicitly addresses the application of assessment in large classes.

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[7] See also http://www.tedi.uq.edu.au/teaching/assessment/index.html