

Evaluation of assessment practices for Bachelor of Construction Management (BCM) program

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Abstract

This project proposes a method to evaluate the current assessment practices for the Bachelor of Construction Management (BCM) program at the University of Newcastle, Australia. To ensure the assessment tasks within the program are constructively aligned to the learning outcomes and be able to provide a cohesive learning experience for students, an assessment checklist has been developed and used to evaluate the assessment tasks for courses within the program. The checklist, namely Assessment Development Checklist (ADC) was intended to be used as part of the Course Outline Peer Review exercise for quality assurance purposes. As a pilot study, this project examined the assessment tasks in the first-year courses (a total of eight courses offered in the 2012 academic year) regarding their alignment to the learning outcomes and their appropriateness to the first year students. Several recommendations and action plans were made in response to the findings of the evaluation. It can be seen that the present study has taken a strong initiative to improve the assessment practices for the BCM program.

Keywords: Constructive alignment, assessment development, assessment checklist

1. Introduction

Recently, an external program review was undertaken for the Bachelor of Construction Management (BCM) program at The University of Newcastle (Australia). The review panel raised concerns and made recommendations about the need to improve the constructive alignment of assessment tasks with learning outcomes. The panel also pointed out that there was inadequate mapping of assessment tasks to learning outcomes to enable students to track their achievement and progression, and some learning outcomes were unspecific and not helpful to students. The program management team needed to ensure there is constructive alignment of assessment methods with learning outcomes. The panel also stressed that a particular area of student dissatisfaction in course experience within the program was the perceived lack of timely, good quality feedback about assignment performance. The panel recommended that essential measures should be taken to address these issues in an innovative and pragmatic view.

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One of the keys to successful learning and teaching is the aligned curriculum (Biggs, 1999): this means that carefully designed assessment tasks allow students to demonstrate achievement of clearly communicated learning outcomes. Ensuring the constructive alignment is one of the key responsibilities of educators (Biggs & Tang, 2007). To ensure the assessment tasks are designed to align with the learning outcomes for the course and be able to provide a cohesive and deeper level of learning experience for students, an assessment checklist has been developed by the authors with reference to the literatures in Australian higher education (Gjibels and Dochy, 2006; Anderson and Krathwohl, 2001; Biggs, 1999; Bloom et al, 1956; Calder and Hanley, 2004; CTL, 2011a; CTL, 2011b).

This checklist, namely Assessment Development Checklist (ADC) was used to evaluate the assessment tasks for all core courses within the Construction Management program. As a pilot study, this project mainly examined the all assessment tasks in the first-year courses regarding their alignment to the learning outcomes and their appropriateness to the first year students.

2. Transition issues and assessment practice in first year courses

The Bachelor of Construction Management (BCM) program was underpinned by the problem-based learning (PBL) approach since its inception in the 90's. The BCM program is offered on-campus and by distance. First-year students in BCM program are often dealing with a lot of transition difficulties. Guidance Mentor Report shows that our first-year students often experienced difficulties with assessment items and in connecting with university facilities and services in general (De Vitis et al, 2010). Indeed there is ample literature have reported that first year students usually struggle with transition issues to both PBL and higher education (Calder and Hanley, 2004; McInnis et al, 2000; Teakle, 2008). Adjusting to studying at university can be a challenge for students whether they are studying on-campus or by distance education (Byrne and Flood, 2005). In Australia one quarter of first year students who started as full-time enrollees but then shifted to part-time enrolment as a result of transition difficulties (James et al, 2010). Multi-campus universities and those with large proportions of distance education often had high attrition rates among the first year students because it was harder for their students to access services (Ross, 2011).

One of the potential ways of overcoming the transition issues is to properly design the learning activities and assessments to take into account the fact that students are first year student and need some basic skills in particular areas. Academic literacy and communication skills are therefore important, so the need for these meant they needed to be identified and embedded in the assessment tasks. Assessments must be both formative and summative in order to simultaneously give value to the first year student and be valued by them (Byrne and Flood, 2005). Heavy weighting of the assessment half-way through the semester should be avoided as this may increase high levels of drop out (De Vitis et al, 2010). The appropriateness of the assessment items for the first year courses should be regularly evaluated and reviewed. This can be done by the newly developed assessment checklist.

3. Methodology

3.1 Developing the Assessment Development Checklist

It is of great interest to design assessment tasks that will tell us whether and how well each student achieves the learning outcomes. The assessment tasks should be guided by a grading criteria scheme which allows for judgments of the quality of student performance, and by determining how well learning outcomes have been achieved during the course. The guidelines in developing effective assessment tasks have been extensively discussed in Australian higher education literatures (Gjibels and Dochy, 2006; Anderson and Krathwohl, 2001; Biggs, 1999; Bloom et al, 1956; Calder and Hanley, 2004; CTL, 2011a; CTL, 2011b). In this study, the Assessment Development Checklist (ADC) was developed with reference to these literatures and intended to be used as part of the Course Outline Peer Review (COPR) process for quality assurance purposes. The course coordinator will use this checklist to evaluate their assessment tasks to ensure there is constructive alignment of intended learning outcomes and assessment. With the aid of this checklist, the course coordinator also understands the process of developing effective assessment tasks to drive the student academic experience and hence student learning. Besides, course coordinator is also aware of the importance of providing timely and good quality feedback about assignment performance. Figure 1 shows a sample of ADC. The checklist consists of 3 sections. The first two sections address the course learning outcomes and learning activities, whereas Section 3 is related to the development of the assessment items. The course coordinator shall tick the check box to confirm if each task is completed or otherwise give comment if applicable.

3.2 Scope of the project

This project aims to evaluate and improve the current assessment practices for an undergraduate construction management program in response to the outcome of the external program review recently. Due to time and resource constraints, this project will not evaluate the assessment tasks for all the courses within the BCM program (29 core courses). To be more manageable, the project only examined the assessment tasks in first-year courses. A total of eight first year courses offering in the 2012 academic year (4 for each semester) were studied and their assessments were evaluated by the course coordinators using the Assessment Development Checklist. By means of the checklist, the alignment of assessment tasks with the learning outcomes and their appropriateness to the first year students were evaluated. Table 1 shows the course names, the offering semesters and the enrolments.

Since the focus of this project is on the evaluation of assessment practices across first year courses within the program, therefore the contents of the assessment and the teaching and learning activities (TLAs) have not been discussed, though it is important to ensure that the TLA is appropriate for the intended learning outcome and any subsequent assessment tasks. The course outline of each first year course was also examined to check whether all the necessary information related to the assessment tasks has been properly given.

Course Information		
Course Name: _____	Course Code: _____	Semester: _____
Section 1 – Course Intended Learning Outcomes (CILOs)		
▪ The learning outcome statements contain action verbs ¹ that help classify learning outcomes according to their perceived complexity ²		<input type="checkbox"/>
▪ Learning outcome statements for the course clearly identify criteria which will indicate that students have achieved the intended learning outcomes.		<input type="checkbox"/>
▪ The course learning outcomes are explicitly mapped to the program objectives/graduate attributes		<input type="checkbox"/>
▪ The course learning outcomes are related to the students' prior knowledge.		<input type="checkbox"/>
Section 2 – Teaching and Learning Activities (TLAs)		
▪ There is a clear alignment between expected learning outcomes, what is taught and learnt, and the knowledge and skills assessed.		<input type="checkbox"/>
▪ The teaching and learning activities are linked to the assessment items		<input type="checkbox"/>
Section 3 – Assessment Tasks (ATs)		
3.1 Define objectives		
▪ Objectives of assessment tasks are explicitly mapped to the course learning outcomes.		<input type="checkbox"/>
▪ Assessment tasks are aimed to assess subject-specific knowledge and skills as well as relevant generic skills.		<input type="checkbox"/>
3.2 Decide on assessment instruments		
▪ Assessment tasks have been chosen that will appropriately assess the learning outcomes. (Please tick the type of assignments being used; can tick more than 1 if applicable) <input type="checkbox"/> Report <input type="checkbox"/> Reflective journal <input type="checkbox"/> Blog <input type="checkbox"/> Test <input type="checkbox"/> Quiz <input type="checkbox"/> Essay <input type="checkbox"/> Thesis <input type="checkbox"/> Group project <input type="checkbox"/> Oral presentation <input type="checkbox"/> Research proposal <input type="checkbox"/> Portfolio <input type="checkbox"/> Graphical drawings <input type="checkbox"/> Others (please specify) _____		<input type="checkbox"/>
▪ Assessment tasks are capable of detecting the higher-order learning outcomes that characterise higher education.		<input type="checkbox"/>
▪ Assessment tasks are weighted to balance the developmental ('formative') and judgemental ('summative') roles of assessment (Avoid 50% assessment half-way through the semester).		<input type="checkbox"/>
▪ The overall balance of assessment activities across tasks can fairly reflect the balance of learning outcomes for a course.		<input type="checkbox"/>
▪ Assessment tasks are checked to ensure there are no inherent biases that may disadvantage particular student.		<input type="checkbox"/>
▪ Plagiarism is minimised through careful task design, explicit education and appropriate monitoring of academic honesty.		<input type="checkbox"/>
▪ The submission requirements such as format and referencing style are clearly described.		<input type="checkbox"/>
3.3 Criteria and Marking System		
▪ Criteria specified clearly to allow judgement as to student's performance.		<input type="checkbox"/>
▪ Qualitative standards or levels of expected performance for the assessment tasks have been described.		<input type="checkbox"/>
▪ Grades are calculated and reported on the basis of clearly articulated learning outcomes and criteria for levels of achievement.		<input type="checkbox"/>
▪ Moderation has been planned with markers to develop shared understandings of the expected standards and facilitate consistent application.		<input type="checkbox"/>
3.4 Guideline on Date and Method for Submission of Assignments		
▪ The day, date and time by which assignments must be submitted have been clearly specified in the course outline		<input type="checkbox"/>
▪ The required methods of assignment submission have been stated in the course outline.		<input type="checkbox"/>
3.5 Guidance and Feedback to Students		
▪ Provision of assignment information, guidelines, descriptions, examples, tips, resources and rubrics.		<input type="checkbox"/>
▪ Provision of academic integrity guidance and link to referencing guide.		<input type="checkbox"/>
▪ Explanation of the marking rubrics to students prior to the task		<input type="checkbox"/>
▪ Provision of feedback on the assessment item to each student within three weeks of submission.		<input type="checkbox"/>
▪ Provision of explanatory and diagnostic feedback as well as grades to each student.		<input type="checkbox"/>
▪ Provision of feedbacks for further improvement on coursework.		<input type="checkbox"/>

¹ Action verbs are organised into a hierarchical structure or levels such as in the [SOLO](#) and [Bloom's Taxonomy](#)

² Steady progression in the complexity and demands of assessment requirements in the later years of courses.

Figure 1: Sample of the Assessment Development Checklist

Table 1: First year courses offered in 2012 academic year

Course Name	Offer in	Class Enrolment
ARBE1100 Communication in the Built Environment	Semester 1	341
ARBE1101 Construction Technology 1	Semester 1	337
ARBE1102 Construction Ecology 1	Semester 1	325
ARBE1303 Introduction to the Construction Industry	Semester 1	203
ARBE1301 Law and Legislation	Semester 2	215
ARBE1304 Building Code and Compliance	Semester 2	225
ARBE1103 Communication in the Built Environment 2	Semester 2	295
ARBE2100 Construction Technology 2	Semester 2	286

4. Evaluation results and discussion

4.1 Overview of Evaluation of Assessment across First Year Courses

The evaluation results (the completed checklists) were collected and analysed. In general, the assessment items in first-year courses were well designed showing clear and appropriate learning objectives. A variety of assessment methods (both traditional and modern) such as report, group project, portfolio, blog, technical drawings, reflective journal and quiz etc. were used across the first year courses. The assessment tasks were generally weighted to balance the developmental ('formative') and judgemental ('summative') roles of assessment. The criteria and marking system were properly designed and specified clearly to allow judgement as to student's performance. Adequate guidance and supports were provided to assist student to complete the assignments. However, many courses due to high enrolments were found not able to provide timely and good quality feedbacks about assessment performance. The following sections discuss the major findings from the assessment evaluation results. In response to the findings, the appropriate responses and recommendations were made to the program management team for the continued improvement of the practice of assessment within the BCM program.

4.2 Evaluation of the Course Learning Outcomes

The course intended learning outcomes of all first-year courses were found contained action verbs according to the revised Bloom's Taxonomy (Anderson and Krathwohl, 2001). The use of these action verbs would help classify learning outcomes according to their perceived complexity. In the first-year courses, the lower-order learning outcomes were commonly used (e.g. describe and explain their understanding of the subject matter) to build up students' factual and conceptual knowledge.

For some second semester courses (ARBE1103 and ARBE2100), it was assumed that students would have achieved a level of knowledge of the subject area that would prepare them to cope successfully with the content of the course, through the first semester courses (ARBE1100 and ARBE1101). Students who do not have the recommended level of assumed knowledge were not prevented from enrolling in a course, but they may be placed at a

considerable disadvantage. Though the assumed knowledge was clearly indicated in the course outline, there was no guidance/advice to those students enrolling in a course without the recommended assumed knowledge.

Recommendation and Action plan for improvement

The course coordinator will inform students about the importance of “assumed knowledge” and its implication in the first week of the semester. Any students who have not achieved the recommended level of assumed knowledge will be advised to seek for assistance from the student tutors and/or the learning advisers offered by the Centre for Teaching and Learning at the University of Newcastle.

4.3 Evaluation of the Teaching and Learning Activities

In general, there was a clear alignment between expected learning outcomes, what was taught and learnt, and the knowledge and skills assessed. The teaching and learning activities were generally linked to the assessment items. However, the external review panel identified some feedbacks from students stating that the delivery techniques could be improved in certain courses e.g. ARBE1100 and ARBE2100, where the content was considered to be ‘dull’ and ‘dry’.

Recommendation and Action plan for improvement

The teaching and learning activities should be varied and appropriate to the student profile. These activities should also be able to assist students actively participating in an online learning community. Teaching staff are encouraged to take the teaching certificate courses offered by the Centre for Teaching and Learning at The University of Newcastle to explore the use of interactive teaching and learning methods to enhance both on-campus and distance student learning and engagement. Moreover, teaching staff are encouraged to contextualise the contents of a course by relating the course contents to relevant job roles and to invite industry professionals to expose students to professions and diverse career paths.

4.4 Evaluation of Assessment Practices

4.4.1 Define objectives

The assignments items were explicitly mapped to the course learning outcomes for all BCM courses. However, the objectives of the assessment item were not clearly defined.

Recommendation and Action plan for improvement

Objectives of each assessment item should be clearly defined and mapped to the course learning outcomes. This action will be implemented in the next course outline peer review process.

4.4.2 Decide on assessment instruments

A variety of assessment methods were found in the first year courses. To assess the achievement of the goals of PBL, several unconventional assessment instruments such as reflective journals and authentic tasks as identified by Wetherell et al (1999) were commonly used in the first-year courses. Other modern assessment instruments such as blogs reflective journals and online quizzes as formative assessments were also used. The use of authentic tasks in the assessments is believed a key principle of any PBL assessment. The uses and advantages of authentic tasks are discussed in situated learning by Cognition and Technology Group (CPG, 1993). Through the use of a range of authentic assessments, the BCM students were able to perform real-world tasks that demonstrate meaningful application of essential knowledge and skills.

The assessment items in the first year courses were generally designed aiming to develop students' academic literacy and communication skills helping them to cope with the transition challenges. Moreover, the objectives of assessment were commonly defined to achieve the lower-order learning outcomes (e.g. factual knowledge).

For some courses (i.e. ARBE1301 and ARBE1304), the assignments were weighted 50% or more half-way through the semester. The formative components in these courses were considered inadequate.

Recommendation and Action plan for improvement

The BCM program, underpinned by the PBL approach, should continue exploring the use of unconventional assessment methods to assess students' skills and knowledge. Assessment tasks should be weighted to balance the developmental ('formative') and judgemental ('summative') roles of assessment. Selecting assessment methods according to how well they assess students' achievement of course learning outcomes will promote valid assessment. Some learning outcomes are more effectively assessed by particular methods of assessment. The effectiveness and appropriateness of each assessment method will be discussed in the course outline peer review meeting. Course coordinators will be advised to avoid 50% or above assessment half-way through the semester.

4.4.3 Evaluation of Criteria and Marking System

For all assessment tasks, the grades were calculated and reported on the basis of clearly articulated learning outcomes and criteria for levels of achievement. Moderation was planned by the course coordinators with markers to develop shared understandings of the expected standards and facilitate consistent application.

Recommendation and Action plan for improvement

The program management team should review and monitor the criteria and marking system on a regular basis for continual improvement. A well designed marking scheme can be a useful way of providing feedback to students following marking. More specific rubrics provide

better guidance and/or feedback to students (Marzano, 2002). The criteria and marking system for each assessment will be examined in the course outline peer review meeting. The course coordinators will be advised to make reference with the tips developed by Hughes (2007) in formulating clear criteria for assessment tasks.

4.4.4 Evaluation of the guideline on date and method for submission of assignments

The date and time by which assignments must be submitted were clearly specified in the course outline. However, many major assignments in the various courses were found all due on the same day and this would be very stressful to students and could lead to problems.

Recommendation and Action plan for improvement

The program management team should review and monitor all the submission dates to avoid significant clash of submission dates. In the course outline peer review meeting, all the submission dates for assignments in the various courses undertaken in each year level of each course will be, to the extent possible, evenly spread over the semester, and that they do not clash with the dates of in-class tests and assessments of other courses.

4.4.5 Evaluation of Guidance and Feedback to Students

Many courses (e.g. ARBE1100, ARBE1101 and ARBE1102) due to large class size (more than 300 enrolments) were often found not able to provide timely and good quality feedbacks about assessment performance. This was also a concern raised by the panel members during the external program review. The assignments used in these courses were generally in the form of written reports, graphic drawings, blogs and quizzes. Feedbacks on these assignments were just given in 2-3 short sentences without much interpretation. Besides, the feedback for future improvement was also considered to be inadequate.

The assessments for the courses (from the design, to the evaluation and reporting of student achievement) should be developed not only could guide student approaches to study through providing them with appropriate feedback on their performance, but also could help them to determine their readiness to proceed to the next level of study, to judge their 'fitness to practice' and ultimately protect and guarantee academic standards in higher education as stated by the Centre for the Study of Higher Education (CSHE, 2011). In Scott's (2005) analysis of student evaluations of their university experience in Australia, a common theme was that students wanted more meaningful and timely feedback. Timely feedback is effective if students receive it when it still matters to them and in time to use it to improve performance (Gibbs and Simpson, 2004). However, this is not easy in mixed-delivery courses with a range of assessors, including sessional staff, and where genuine efforts are made to ensure quality control of the marking process by post marking moderation (TDU, 2008).

Recommendation and Action plan for improvement

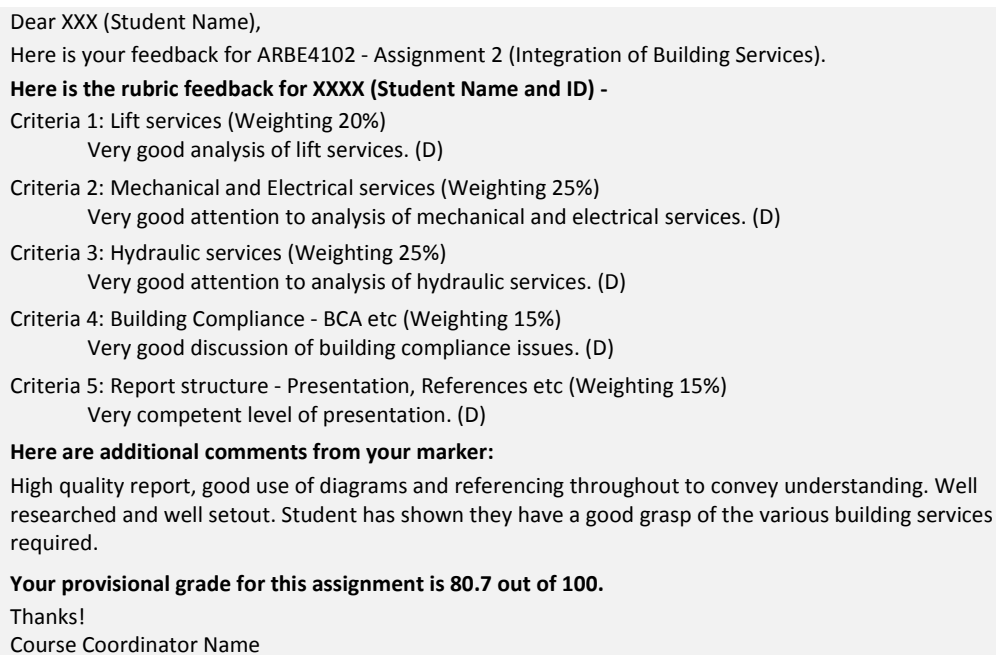
For many first year students, the submission of the first assignment can be a very stressful experience because it brings together a range of requirements that may be quite alien to

students who may not have previous experience of university study. Provision of adequate supports includes online writing and referencing tutorials, examples of previous assignments in the course by way of providing positive and negative exemplars and various other preparatory sessions should be made available to students.

To address the needs for the timely provision of good quality feedback, in particular for large classes in first year, our program management team has just developed a new automated personal feedback system. The system not only allows for easier marking, but also provides constructive individualized feedback emailed directly to students from the marking sheet. It also makes the entering of marks into Blackboard a very fast and simple procedure. Figure 2 shows a sample of the automated personal feedback emailed to the student.

For each assessment item to be graded, the marking rubric from the course outline is incorporated directly into an Excel marking sheet. The sheet allows the marker to enter individual feedback comments as well as adjust grades for late penalty for each student. Once all assignments are graded the course coordinator is then able to send emails to all students in one go, and at the same time enter grades into a spreadsheet then be uploaded directly into Blackboard. This process could previously take several days for an academic to both individually email students their feedback, and also enter grades in Blackboard.

Currently the system is in the first stage of development, and initial feedback from both staff and students has been very encouraging. A more advanced version of this system is currently in development. The program team will continue monitor and review the current feedback practices to ensure it is meeting students' needs for the timely provision of good quality feedback for further improvement.

A screenshot of an automated email message. The text is as follows:

Dear XXX (Student Name),
Here is your feedback for ARBE4102 - Assignment 2 (Integration of Building Services).
Here is the rubric feedback for XXXX (Student Name and ID) -
Criteria 1: Lift services (Weighting 20%)
Very good analysis of lift services. (D)
Criteria 2: Mechanical and Electrical services (Weighting 25%)
Very good attention to analysis of mechanical and electrical services. (D)
Criteria 3: Hydraulic services (Weighting 25%)
Very good attention to analysis of hydraulic services. (D)
Criteria 4: Building Compliance - BCA etc (Weighting 15%)
Very good discussion of building compliance issues. (D)
Criteria 5: Report structure - Presentation, References etc (Weighting 15%)
Very competent level of presentation. (D)
Here are additional comments from your marker:
High quality report, good use of diagrams and referencing throughout to convey understanding. Well researched and well setout. Student has shown they have a good grasp of the various building services required.
Your provisional grade for this assignment is 80.7 out of 100.
Thanks!
Course Coordinator Name

Figure 2: Sample of the automated personal feedback emailed to student

5. Conclusion

The assessment tasks in the first-year courses within the BCM program were evaluated using a newly developed checklist. The checklist identified areas for future improvement in assessment practices for the program. Several recommendations and action plans have been made in response to the findings of the evaluation results. It can be seen that the present study has taken a strong initiative to improve the assessment practices for the BCM program. However, this project only examined the assessments in first-year courses subject to the time and resource constraints. Further study on the assessment items in higher level courses should be carried out to give a thorough understanding of the assessment practices across the years of the program. Moreover, the effectiveness of the checklist should be reviewed and monitored on a regular basis.

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References

- Anderson L W, Krathwohl D R A (2001) *Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Addison Wesley Longman.
- Biggs J (1999) "Enhancing teaching through constructive alignment." *Higher Education*, **32**(3), pp. 347-364.
- Biggs J, Tang C(2007) *Teaching for quality learning at university: What the student does*, (3rd ed.). Berkshire, UK: Society for Research into Higher Education & Open University Press
- Bloom B S, Engelhart M D, Furst E J, Hill W H, Krathwohl D R (1956) *Taxonomy of educational objectives: the classification of educational goals*. Handbook I: Cognitive Domain, New York, Longmans.
- Byrne M, Flood B (2005) "A study of accounting students' motives, expectations and preparedness for higher education." *Journal of Further and Higher Education*, **29**(2), 111-124.
- Calder A, Hanley P, "Transition – helping students bridge the gap", *Issues of Teaching and Learning @ JCU*, **2**(2), (2004).
- Centre for Teaching and Learning (CTL) (2011a) *Seven interrelated essential online course components: What makes up an online / blended course?* The University of Newcastle, Australia. Courtesy of Dr. Krishnan S.

Centre for Teaching and Learning (CTL) (2011b) *Teaching in the online environment: Engaging with content*. University of Newcastle, Australia.

Centre for the Study of Higher Education (CSHE) (2011) *Assessing Learning in Australian Universities: Ideas, strategies and resources for quality in student assessment*, (available online <http://www.cshe.unimelb.edu.au/assessinglearning/docs/CorePrinciples.pdf> [accessed on 22/5/2012]).

Cognition and Technology Group (CTG) (1993) "Anchored Instruction and Situated Cognition Revisited", *Educational Technology*, **33**(3), pp. 52-70.

De Vitis S, Sher W, McBride B (2010) *Guidance Mentor Report Semester 1 & 2 2010*. Faculty of Engineering and Built Environment, School of Architecture and Built Environment The University of Newcastle.

Gibbs G, Simpson C (2004) "Conditions under which assessment supports students' learning". *Learning and Teaching in Higher Education (LATHE)*, 2004-2005(1), 3-31.

Gjibels D, Dochy F (2006) "Students' assessment preferences and approaches to learning: can formative assessment make a difference?" *Educational Studies*, **32**(4), pp. 399-409.

Hughes C (2007) *Quickbite: Practical guidelines for writing assessment criteria & standards*, (available online http://www.uq.edu.au/teaching-learning/docs/Writing_Criteria_Standards.doc [accessed on 22/5/2012]).

James R, Krause K L and Jennings C (2010) *The first year experience in Australian universities: Findings from Findings from 1994 to 2009*. Centre for the Study of Higher Education, The University of Melbourne, (Available on http://www.cshe.unimelb.edu.au/research/experience/docs/FYE_Report_1994_to_2009.pdf [accessed 3 September 2012]).

Marzano R J (2002) A comparison of selected methods of scoring classroom assessments. *Applied Measurement in Education*, **15**(3), 249 – 267.

McInnis C, James R, Hartley R (2000) *Trends in the First Year Experience in Australian Universities*, DETYA, Canberra.

Ross J (2011) *Surprises in undergraduate attrition rates: foreign students trump locals*, The Australian, (Available on <http://www.theaustralian.com.au/higher-education/surprises-in-undergraduate-attrition-rates-foreign-students-trump-locals/story-e6frgcjx-1226141842325> [accessed 3 September 2012]).

Teaching Development Unit (TDU) (2008) *Assessment Guide: Implementing criteria and standards-based assessment*, (available on http://www.tdu.uws.edu.au/qilt/downloads/Assessment_Guide.pdf [accessed on 1/11/2012]).

Teakle N (2008) *Problem based learning for first year students: Perspectives from students and laboratory demonstrators*, School of Plant Biology, The University of Western Australia.

Wetherell J, Mullins G, Hirsch R (1999) "Self-assessment in a problem-based learning curricula in dentistry", *European Journal of Dental Education*, **3**, pp.97-105.