ABSTRACT

Today in many universities, the classroom comprises local and international students from a wide range of backgrounds. Biggs (1999), Ramsden (1988) and Entwistle (1997) have developed the concepts of 'surface' and deep' learning for the tertiary classroom. Most students use both a 'deep' approach to learning, by focussing on understanding the meaning of reading material and a 'surface' approach by repeating explanations presented (Marton & Saljo,1976: 4-11). Students are to be encouraged to move along the continuum towards deep learning.

This research study identified significant differences in academic results of international and local students in all but one of a subject's assessment tasks. As a result, a change strategy was introduced to help international students by skewing the weighting on assessment items towards those on which international students had performed relatively better. The next
semester results again showed significant differences on overall assessment. A second change strategy was then introduced based on examples from Biggs’ framework for ‘Encouraging Deep Learning’ (1999). It promotes active and analytical student learning using an incremental schedule for encouraging lower performing students to progressively use deep learning techniques in an effort to improve their learning outcomes. This paper provides a rationale and analysis of both change strategies.

**Keywords:** ‘Multiculturalism and indigenous education’

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**Improving learning outcomes in a multicultural classroom**

**Introduction**

Tertiary institutions in Australia have increasingly relied on income generated from international students. These students are required to pay higher fees for their education than local students. This development raises the question of whether they are receiving an education that offers them an equal opportunity of learning and succeeding academically as local students. Walkington (1990) suggests that multicultural education is a part of a ‘wider interest in equality of opportunity’ and ‘the problem for the multiculturalist lies in developing a transcultural conceptual scheme in education’ (1990:82). To achieve an educational outcome which is transcultural, this research project explores the meaning and implications of a teaching program that is oriented towards ensuring that all students adopt a deep approach to learning as a means of improving learning outcomes.

‘Multicultural education is about dialogue across diverse groups’

(Arbor, 2001:18)

The aim of this research project is to choose an appropriate way of improving learning outcomes in a multicultural classroom. The first attempt to improve learning outcomes by changing the assessment was unsuccessful in either improving the average results in the subject or significantly improving the relative performance of international students. Leading authors in the field of education such as Biggs (1987), Marton and Saljo (1984), Van Rossum and Schenk (1984), and Watkins (1983) have conducted studies which indicate that a deep approach to learning leads to improved learning outcomes. Hence the learning approach adopted by students affects their learning outcomes, which for the purposes of this paper are taken as the marks scored by students in the subjects in this case. When students are motivated to understand what they learn, they use ‘deep’ learning strategies. This approach allows the learner to remember and apply the learning more readily than if they should memorise without understanding key terms by ‘surface’ learning (Biggs, 1991:19).

An awareness of learning outcome differences between international and local students resulted from comparing the results of local and international students on three assessment tasks and final exam results in a first stage tertiary finance subject in the School of Business during semester 1, 2000. The results from the semester showed that in all but one assessment task, international students’ results were significantly lower than local students. In response to this finding, different learning strategies were implemented in semester 2, 2000. The first strategy was to change
the assessment mix in favour of an increased weighting to the assessment tasks on which international students performed relatively well. The second change was to encourage students along a continuum toward a greater reliance on a deep approach to learning. This latter strategy was chosen for the improved learning outcomes that are generated by deep learning strategies. The research has been conducted to investigate the following questions:

1. Are there significant differences between the learning outcomes (results achieved) of international and local students studying a first stage finance subject?

2. Can changing the assessment tasks reduce the differences between the marks achieved by local and international students? In this case, the changes made were to increase the weighting towards items on which international students scored at a minimum difference to local students.

3. How can educationalists encourage the adoption of a deep learning approach from students who have previously used mainly surface learning techniques? In this case, the changes made were to improve the first stage finance subject under investigation.

Background to study.

This section will discuss four main issues. These are, to understand different approaches to learning; recognising the influence of presage factors; the accepted preference for deep learning; and ways to encourage deep learning.

- Understanding different approaches to learning

Research on student populations to determine whether a particular culture has a predisposition to an approach to learning has provided mixed results. In studies by authors such as Samuelowicz (1987), Ballard & Clanchy (1991), it was claimed that Asian students were more likely to be categorised as rote learners compared to Western students. They classified Asian students' learning styles as passive, relying more on memorising than understanding the subject material, compared with Western students. This is usually associated with a surface approach to learning.

Biggs (1990, 1996), Watkins, (1996) Volet and Kee (1993), and Ramburuth (1999) have challenged the stereotyping of Asian students as surface and rote learners by testing a range of student groups, mainly within Australian tertiary institutions. Biggs (1996) claimed that the view that Asian students are surface learners was based on a misunderstanding of learning behaviour, particularly the common assumption that rote learning necessarily reflects surface learning. Biggs explains that memorising may be a technique used to ensure sufficient familiarity with the main concepts to allow students to understand the meaning and implications of concepts (Biggs and Watkins, 1996: 272). 'Deep memorising' is the reverse of this, and is when students understand first and then may memorise to make sure their answers in assessment are accurate (Tang and Biggs, 1996: 176). The other problem with the conclusions drawn from some of the early studies is that the cross-cultural studies administered Western developed tests that were applied to non-Western students and scored accordingly. To remedy this, research techniques need to ensure that the instruments used measure equivalent concepts across cultures to assure equivalent
constructs (Watkins, 1996: 9). Volet and Kee found that initial differences in the approach to learning between local Australian students and newly arrived Singaporean students disappeared by the end of their first semester of study in Australia (1993:3). Ramburuth found no statistically significant differences between the 78 international and 110 local students in their overall 'Approaches to Learning' in an Australian university (1999: 7).

The term 'approaches to learning' evolved from the Marton and Saljo (1976:39) research project in which student responses to a text were identified and categorised according to whether they exhibited characteristics of surface or deep learning. One group of students focused on the physical aspects of reading the text itself with some reciting parts of it, and the other focused on the meaning contained in the text. The former group was said to have used a 'surface' learning approach and the latter a 'deep' learning approach.

Approaches to learning refer to the ways in which students go about their academic tasks, thereby affecting the nature of the learning outcome. (Biggs, 1995: 2).

Biggs' 3P Learning Model (1991:16) identifies the sequential interrelationship between presage, process and product (outcome) stages of learning. In Biggs' 3 P Learning Model the second stage of learning is the 'process' of learning and it covers a broad spectrum of the learning process that includes students' approach to learning.

Biggs identified three motivational approaches to learning, which are referred to as 'surface', 'deep', and 'achieving', although the former two are the 'core' approaches. The process learning stage is partly shaped by the previous experiences or 'presage' factors, but may be influenced by the context in which the teaching and learning occurs. A surface approach reproduces the bare essentials and is often achieved by a reliance on rote learning. The motive for this is to:

Get it over with quickly and with minimal pain (Schmeck, 1988:11).

And the strategy uses:

Lower level components rather than higher-level ones - words and sentences rather than main ideas and themes. (Schmeck, 1988:11).

The distinction is also that deep learning is intrinsically motivated and surface learning is extrinsically motivated. This difference is:

Between learning for personal understanding and development, and learning necessitated by fulfilling the requirements of others.

(Entwistle, 1988:227).

An achieving approach is shown by motivation to gain the highest possible grades in a subject. This learning approach is typified by a strategy of attending all classes, doing all the required work, and any extra work that may help achieve the intended
outcome (Watkins, 1996: 8).

A summary of these approaches to learning is shown in Table 1 below.

**Table 1: Three proto-typical approaches to learning.**

<table>
<thead>
<tr>
<th>motive</th>
<th>strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SURFACE</strong></td>
<td>Extrinsic: avoid failure but don't work too hard</td>
</tr>
<tr>
<td><strong>DEEP</strong></td>
<td>Intrinsic: satisfy curiosity about topic</td>
</tr>
<tr>
<td><strong>ACHIEVING</strong></td>
<td>Achievement: compete for highest grades</td>
</tr>
</tbody>
</table>

(Biggs, 1991: Table 1, 19)

Specifying two rather than three learning approaches is consistent with the work of Ramsden, who distinguishes the two approaches to learning in Higher Education - deep and surface. The problem with adding a third approach as a separate category is that students adopting a 'strategic approach' (Entwistle) or an 'achieving approach' (Biggs), will use either a 'deep' or 'surface' technique to fulfill their intentions to achieve the highest possible grade. The third category is therefore not a separate learning approach and probably explains why Biggs regarded the third category as less relevant in some circumstances.

The feature that distinguishes students into an approach for Entwistle and Biggs is 'their intention' of learning. If their intention is to understand ideas themselves, they adopt a 'deep approach', whereas if their intention is just to cope with course requirements they are classified as adopting a 'surface approach.' If they intend to achieve the highest possible grades then they exemplify a 'strategic approach.'

- **Recognising the influence of presage factors**

Presage factors are those prior learning experiences that affect the way students learn in the current context. In this case, relevant presage factors may affect a readiness of enrolled students to learn a specialist tertiary subject in English, in a context that may differ from previous learning experiences in primary and secondary education. Students may view learning as mainly a matter of acquiring information and reproducing it accurately, if their previous learning experience adopted this approach (Entwistle, 1997: 17). Some of the international students who make up approximately half of the students in the first stage finance class may enter the subject with very different educational background, expectations, culture and abilities to study at tertiary level in a subject in which all communication and resources are in English.
The other type of presage factors is prior influences that impact the teaching context. These include the values, culture and experience of the teacher, which shape views on what should be included in the curriculum, how it should be presented, learning techniques, types of assessment, and teacher student relationships in the classroom. Recognition of presage influences infers that learning depends on prior knowledge, views and practices.

There are two reasons proposed in the literature for making use of the prior experience of current students and making it worthwhile to explore students' backgrounds, and they are that:

Students have valuable experience and knowledge, which needs to be built upon, by universities. (Nightingale, 1995:119).

Secondly, awareness of these prior experience factors is relevant because:

Each of these factors has an immediate and direct effect on performance (and) each is likely to affect in various ways the student's motives for undertaking learning, and the strategies adopted in approaching learning. (Biggs, 1987: 10).

- Preference for Deep Learning

Deep learning is preferred because it is more likely to facilitate long term retention. There is strong evidence that deep learning facilitates an ability to transfer a body of knowledge and skills, and those skills are more likely to be used in a variety of ways and contexts. This is because when learning is understood it is more likely to be recollected and applied than learning that is memorised without understanding. It builds on 'the potentiality for transfer.' (Entwistle, 1990: 664). The ability to transfer learning is enhanced from one context to another when ideas are organised and associated with other ideas. This allows integration of the parts of a learning unit and thus encourages an holistic approach. This is a compelling advantage of deep learning over other approaches to learning.

There is consensus in educational research that deep learning is a preferred learning approach (for example, Biggs, 1999, Marton, 1988, Entwistle, 1990 & Ramsden, 1988). This can be explained by the learning outcomes for those who adopt a deep approach. Deep learning allows the learner to understand the full meaning of what has been learned, including the implication and links between the content and other topics and concepts. Marton (1988: 321) refers to a deep approach as one that generates a 'communicative intent' or expresses understanding using the learners' explanation rather than paraphrasing the author's words. Deep learning therefore involves the learner searching for meaning and reshaping prior thoughts and ideas.

The gap between reproduction and understanding represents a quantum leap in the quality of what has been learned. (Hounsell, 1984:192)

Deep learning is more likely if the learner is able to relate the new learning to prior knowledge and understanding (Entwistle, 1990: 664). Wide reading and an understanding of inter-related ideas are used in the pursuit of deep learning. Meta-
learning or understanding one's own learning pattern affects the process of learning stage, and is more often adopted by deep learners (Biggs, 1981: 75).

Biggs developed an operational strategy to encourage students who use surface learning, to adopt techniques that encourage deep learning. Figure 1 (below) shows the main elements needed to achieve deep learning. This strategy shows how 'Robert' who has previously been a surface learner, may adopt deep learning to achieve:

The same level of understanding that their colleagues achieve spontaneously. (Biggs, 1999: 3).

The three issues below affect the receptiveness of students to deep learning. They include:

- The academic orientation of the student
- The student's level of engagement, and
- The degree of learning-related activity. (Biggs, 1999: 3-5)

It is the last characteristic listed above that is directly accessible to the teacher's influence. By engaging the student in learning activity over time, the academic skills or orientation of the student may be strengthened. This requires that the students who are at the 'passive' end be assisted to move towards the 'active' end of the spectrum. It requires "engaging" surface learners as active learners in lectures and tutorials, and this concept has been represented diagrammatically on Figure 1 below.

In this figure, 'Robert' needs to become more active and move along the continuum towards 'Susan'. This requires that 'Robert' questions, speculates and generates solutions, so that he uses higher cognitive solutions. Biggs explains that when students use a deep approach they use the full range of learning activities. They learn terminology, memorise formula, and are able to apply the formula to new situations.

![Diagram showing the spectrum of learning styles](image-url)
Many students are capable of adopting a 'deeper' approach to learning if the learning context requires it (Ramsden, 1988: 174). This implies that the categorisation of approaches to learning is not tight, and that they change from one learning situation to another and even from one task to another.

It is true beyond any reasonable doubt that individual students in higher education display variability in their approaches to learning tasks. Deep and surface approaches to learning are highly responsive to the context of learning. (Ramsden, 1988: 174)

The provision of an appropriate context to encourage deep learning is the focus for the latter part of this paper. What are the characteristics required for a learning situation to be conducive to deep learning? The list of teaching techniques and classroom activities in Figure 1 above will be adapted to encourage students to change from passive to active students to facilitate deep learning (Biggs, 1999:14-17). If the teaching and learning environment emphasises understanding and tests accordingly, students are likely to adjust their learning to meet the requirement of deep learning.

- Ways to encourage deep learning

The literature suggests that the teacher needs to adopt particular strategies in the organisation of the subject and teaching techniques to facilitate deep learning. These include ensuring a coherent course structure, arousing enthusiasm and reflecting on teaching and student activities and responses in the classroom. The teacher can also be instrumental in providing students with the preconditions for deep learning practices. These require providing sufficient choice, opportunities for effective group work using mixed groups, suitable learner activities and an interactive learning atmosphere as discussed below.

Teacher related issues

Teachers may influence the approach adopted by learners in several ways. The subject objectives need to be consistent with deep learning outcomes. This gives students a view on the priorities and breadth of the subject (Biggs 1990:70). If these objectives contain requirements for students to be able to assess, discuss, and evaluate, it will indicate to students that the subject requires higher level skills than recall. There is evidence that the students' perceptions of the teacher's expectations have a profound effect. These are often communicated to students informally and subtly (Entwistle, 1990: 665). Students are quickly aware from the teacher's approach, the subject documentation and assessments of whether surface learning techniques are sufficient or whether deep learning is required to succeed in a subject.
......What you have to do is to have a list of facts: you write down the important points and memorise those, then you'll do all right in the test.' (Student quote in Ramsden, 1984:144)

If the teacher uses deep learning strategies and yet tests surface learning, students will be very sceptical and see that there is a 'hidden curriculum' (Ramsden, 1988: 164). In several investigations, Ramsden (1988:164) has identified assessment methods as:

The most critical situational influence on learning strategies

Teachers are often instrumental in arousing enthusiasm for their subject. It is much more likely that students will adopt a deep approach if the teacher is enthusiastic about a subject. Ways of enlivening students include giving recent issues of controversy within the subject's academic area. An alternative way is to encourage students to be aware of the way they have learnt in the past and to explain the requirements and benefits of deep learning. Students learn better when the instructor has a well structured knowledge base or is sufficiently familiar with the parts of the subject to be able to make connections between them and relate to students' existing knowledge base (Biggs and Moore, 1993: 460 - 475).

Congenial interactions between teacher and student convey the 'atmosphere' of the class/subject to students. Students who suffer from 'fear of failure' are more likely to adopt surface learning. According to Biggs (1991), these sources of anxiety derive from three main factors. They are interpersonal tension such as the teacher embarrassing students with questions directed at individual students without notice. If there is excessive time pressure to cover the course requirements, students will be anxious and often adopt surface learning. Teachers can encourage deep learning by constructing assessments that test student understanding and hence require students to adopt deep learning strategies.

Biggs (1999: 3-6) refers to a resource squeeze in universities, which has affected Swinburne University as it has most Australian universities. Biggs suggests that the realistic solution to assessing one's performance and identifying change strategies is reflecting on one's own situation and 'deriving your own ways of handling them (problems) within your department context.' He sees 'reflecting' as an essential part of teaching, which can be used to intervene in an action learning process. Results from this study motivate reflection on teaching techniques and identifying the parts that allow surface learning and how to encourage deep learning teaching and learning techniques.

Student related issues

Intrinsic motivation is more likely when students carry out tasks that matter to them. Providing choice of topics for students to select for researching is effective when identifying tasks that matter to students. This approach presumes that the student is not a passive recipient of knowledge provided by the teacher, but instead, that their views are valued and integral to class learning. Students have an 'ownership' of the content if they select the topic and their work is differentiated from that of other students. It is therefore understandable that students' perceptions of choice over content and method of study are associated with deep approaches (Ramsden, 1988: 169).
Choice can also be applied to the method of allocating students to groups. Student responses to 'how should groups be chosen?' on a questionnaire (Subject evaluation, semester 1, 2000), provided feedback that students want choice of who they work with. Students criticised group members who did not contribute and yet gained the marks of the group. It was explained to students that a main consideration when allocating students to groups was to ensure that there was at least one native English speaker in each group.

Group work encourages learner activity. Passivity is a characteristic that 'Robert' has in common with many international students - and it prevents them achieving as highly as those students who adopt active learning. One of the solutions suggested is to have more problem-based learning and less lecturing, or to be more realistic, to take a more problem-based approach in lectures. Problem solving requires students to question, speculate and generate solutions, so those students are enticed to use higher order cognitive activity, or move along the spectrum (on Figure 1), from a surface learner towards a deep learner.

Learner activity has to be planned, may be teacher, learner or peer initiated. Student activity enables students to make connections between the parts. Learner activity is enhanced in groups or when there is interaction with others. It is an effective way to encourage interaction, communication and hence active learning. Problem solving is an excellent way to 'apply' principles that have been studied, and it ensures that students understand the concepts studied, as it inevitably requires applying learned concepts and skills in a new context.

Research methodology

To address the research questions posed in the previous section, the researchers analysed the results obtained by students studying a first stage finance subject. This subject is a second year subject that all students who study a finance major at Swinburne University of Technology are required to take as an introductory subject to finance. In semester 1, 2000, there were 90 students studying the subject, of which 50% were local students and 50% were international students. Most of the international students came from an Asian country, such as Indonesia, Malaysia, Thailand or Hong Kong. This research measured differences in the product or learning outcomes of local and international students. The average (mean) of the three assessment items as well as the exam marks were calculated and compared. The tasks that were assessed during the semester were:

- A group oral presentation and written report
- Group workshops
- A short answer test
- An exam that tested students' understanding of the whole subject

The 'group oral presentation and written report', required the skills of communication, analysis and presentation, and was the only task that showed no significant difference between international and local students' marks. It was the only assessment item that allowed students to prepare and research their answers prior to the presentation. The task required analysis of a particular listed company on the Australian Stock Exchange. This assessment item contains several characteristics that encourage deep learning - students chose the company they researched, there was learner activity in researching a company, interaction with others whilst they
organised their group presentation and report. This is why it is an example of a 'deep learning' assessment.

One of the reasons why students use surface learning techniques is because they lack vocabulary in English and hence they lack confidence in their ability to learn in any other way than memorise (Kirby, 1996: 144). The other reason for surface learning may be that students' experience teaches them that it is a sufficient approach to achieve desired grades. Assessment that requires only surface learning may reflect presage influences on the teacher's view of learning. If students are successful with a surface approach to learning, it is likely to become more difficult to entice them to use another approach.

At the end of semester 1, 2000, the following changes were made to the assessment:

- The short answer test was eliminated as an assessment item. This was because the results from this assessment in semester 1 were significantly lower for international than for local students. As it was an assessment that required predominantly surface learning, it was not seen as consistent with the strategy of moving in the direction of deep learning.

- The equity presentation and report was expanded and the marks allocated to it were increased from 10% to 20%, as this was an assessment item in which the results for international and local students showed no significant difference.

- Group workshops were organised differently and the marks allocated to them were increased from 15% to 30%. This was an attempt to ensure that these groups worked more effectively and enabled international students to gain an advantage by working in a small interactive group proficient in English, in which international students would contribute by thorough preparation for the topic to be discussed or tested. Three in a group encourages communication from all members. Group activities enable students to effectively problem solve. Students in interactive groups are able to see how other students learn, thus gaining insight into how they may approach learning, or meta-cognition which acts as an impetus for deep learning (Biggs, 1990: 73).

- Semester assessment items increased from 40 - 50% of total marks. This was in response to the relatively better results of international students in semester assessment results.

Changes to the examination:

- The exam structure was changed. It eliminated the compulsory data analysis question, 10 multiple-choice questions were introduced, and the essay section was reduced from 30 - 20% of total marks. The reduced marks allocated to the exam was in response to the relatively worse results international students scored on the final exam and a intention to reduce stress levels that are associated with too much resting on an exam performance.

Changes to selecting groups:

- A system was trialed with students' retaining some choice and no students
forced to work with another. Each student was handed a piece of coloured paper. There were three colours. The three groups were 'Local students', 'International students' and the third was mature age students, or international students who had excellent language, maturity or another feature that made them atypical. Students self selected their colour. Students were asked to choose two students with a different colour to their own. To ensure that groups are effective they need to have a 'workable' number of students in them.

**t-tests**

In both semesters, the students' marks were compared and tested for significance using t-tests. This test assumes that the data collected is normally distributed, and it is a common and well-accepted statistical procedure for comparing the difference between means from two independent samples (in this case local and international students).

In this research, the null hypotheses tested that there was no significant difference between local and international students on the assessment tasks. On the other hand, alternative hypotheses were used to test that there was a significant difference between local and international students on the assessment tasks. In the analysis, we have used a confidence coefficient of 0.95, which is expressed as \( P < 0.05 \), which means that the probability of this difference not occurring was less than a 5% chance. This means that we are confident that in most situations this difference did occur.

**Research findings**

The research findings are analysed according to the three research objectives outlined in the introduction to this paper. Although casual observation had noted the inferior performance of some international students in assessment tasks in the past, this was the first time that the researchers had systematically compared the results of international and local students.

- **Are there significant differences between the learning outcomes (results achieved) of international and local students studying a first stage finance subject?**

The research findings from Semester 1, 2000 showed that there was a significant difference \( (p < 0.05) \) in the results achieved by international and local students in the group workshop and the short answer test with local students performing significantly better than international students on these assessment items. In both these assessment types, students were working in groups. These tasks, particularly the short answer test, predominantly tested surface learning, whereas the assessments that required deep learning included the equity presentation and report and some questions on the final examination requiring analysis.

The following table provides a summary of the students' results in the main assessment items in semester 1, 2000. 'NS' means that there was no significant difference between local and international students. \( P < 0.05 \) means that there was a significant difference at the 95% confidence level.
Table 2: Average scores achieved by students on the semester 1, 2000 assessment tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Average score Local students</th>
<th>Average score International students</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity presentation and report/10</td>
<td>6.9</td>
<td>6.7</td>
<td>NS</td>
</tr>
<tr>
<td>Group workshop/15</td>
<td>11.2</td>
<td>10.4</td>
<td>P&lt; .05</td>
</tr>
<tr>
<td>Short answer test/15</td>
<td>10.4</td>
<td>8.9</td>
<td>P&lt; .05</td>
</tr>
<tr>
<td>Exam/50</td>
<td>41.8</td>
<td>32.2</td>
<td>P&lt; .05</td>
</tr>
<tr>
<td>Total marks/100</td>
<td>70.4</td>
<td>58.1</td>
<td>P&lt; .05</td>
</tr>
</tbody>
</table>

- Group assessments

The group equity presentation and report was the one item on which there was no significant difference between the two groups. This assessment required the skills of working in a group, researching a company's financial data, presenting findings to the class and report writing. This assessment allowed students time to prepare before the task of an oral presentation and report. All students were able to confer with relevant sources, which helped the more motivated students prepare an answer. Therefore, mixed group work and/or assessments that allow students time to prepare their answers seem to enable international students to achieve results closer to those of the local student cohort. This assessment required collaboration between local and international students.

The relative success of international students on this task is consistent with a greater collaborative approach among international students relative to local students found in Ramburuth's study (1999:1). This is also consistent with the finding that international students scored relatively better in the workshop results (group assessment) than the individually assessed items. There may be other factors influencing the relatively strong performance of international students in group assessments. For example, when international and local students were in 'mixed' groups, in over half the groups there was one member of the group who had strong command of English and could help the group on issues that required local knowledge. Another explanation for the relatively good results of international students in group work is that they learn from local students and are able to benefit from the interaction. It is also possible that in semester 1, when there were often four students in the groups that some students didn't contribute proportionately to the task - particularly in the writing up of the report, or in the workshop answers on which most of the marks were allocated.

The better results from international students on the equity assessment supports the claim that most international students are capable of deep learning, including extracting meaning and building on past understanding. International students may need more time to achieve similar results to local students due to language issues and a lack of knowledge on where and how to source relevant information. For example, several local students had accounts with 'Commonwealth Securities' which
gave them access to data and research that was not available to non-account holders.

In summary, the fact that international students performed better on the group equity assignment than in the group workshops does suggest that international students adopted deep learning techniques that were necessary for this assessment.

All the characteristics of the group work (active learning, inquiry, learning from each other, and applying concepts to new situations) were consistent with a deep learning strategy.

What these results mean

In the context of deep and surface learning, both groups were given tasks that required surface learning (e.g., the short answer test) and deep learning (e.g., the equity presentation and report, and the exam). It was interesting that there was no significant difference between the groups for the equity presentation and report, which was the assessment that required the most deep learning. This is consistent with authors such as Biggs (1990, 1996), Watkins (1996) Volet and Kee (1993), and Ramburuth (1999) who challenged the stereotyping of Asian students as surface and rote learners within Australian tertiary institutions. The findings of this study did not support the stereotyping of Asian students as surface learners relative to local students as claimed by Samuelowicz (1987), and Ballard & Clanchy (1991).

However, the fact remains that for the students tested, there were significant differences in their learning outcomes, and this was well illustrated by the observed significant difference between the results of the two groups of students in the final exam. This shows that without time to reflect, international students perform worse than local students on assessment tasks that require analysis and evaluation.

Future studies could focus on the influence of 'other factors' on learning outcomes. For example, international students may be disadvantaged by presage factors (Biggs, 1991) such as comprehension, and knowledge of local markets and terminology. To classify learning outcomes according to cultural origins needs to be treated with caution, as many of the tests are specific to the research project and there are so many other factors that can affect the learning outcomes recorded.

The results of this research gave mixed findings in regards to the approach to learning adopted by local and the international student cohort. International students performed relatively better on the item of assessment that required the most deep learning and yet local students performed relatively better on the item of assessment that required predominantly surface learning. Local students performed substantially better in all but one piece of assessment, and academic success is normally associated with deep learning.

- Can changing the assessment tasks reduce the differences between the marks achieved by local and international students? In this case, the changes made were to increase the weighting towards items on which international students scored at a minimum disadvantage.

As the first stage finance subject was to be offered again in semester 2, 2000, changes could be easily implemented and measured. The subject's teaching panel
agreed to make changes to the structure of assessment of the subject in favour of the assessment items on which international students had scored relatively better. These changes were outlined in the methodology section.

When analysing the following results, it should be noted that there was a similar number and proportion of local to international students enrolled in the subject in both semesters. The following table summarises the mean scores achieved by local and international students in semester 2, 2000.

**Table 3: Average scores achieved by students on the semester 2, 2000**

<table>
<thead>
<tr>
<th>Task</th>
<th>Average score Local students</th>
<th>Average score International students</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity presentation and report/20</td>
<td>12.1</td>
<td>10.8</td>
<td>NS</td>
</tr>
<tr>
<td>Group workshop/30</td>
<td>20.1</td>
<td>18.4</td>
<td>P&lt; .05</td>
</tr>
<tr>
<td>Exam/50</td>
<td>28.5</td>
<td>21.8</td>
<td>P&lt; .05</td>
</tr>
<tr>
<td>Total marks/100</td>
<td>60.8</td>
<td>50.5</td>
<td>P&lt; .05</td>
</tr>
</tbody>
</table>

The results of the subject in semester 2, 2000 were similar to semester 1, 2000 in that the local students performed significantly better than international students on all but one of the assessment tasks. The results show that the changes that were made to the assessment tasks had minimal effect on reducing the differences between the overall marks achieved by local and international students.

- **Group assessments and the exam**

Again there was no significant difference between the average scores achieved by international and local students on the equity market presentation and report in semester 2, 2000; and again, the average mark for the group workshop was significantly lower for internationals students than local students in semester 2. It was interesting to note that all the students' marks were significantly lower on the final exam in semester 2. In semester 1, the average mark scored by local students was a 'credit' (over 65%), but in second semester it was 57%. International students' marks were similarly lower on the final exam. In semester 1, the average mark for international students was 54% whereas it was 44% in semester 2.

**What these results mean**

Student scores were lower on all assessment in semester 2. This could suggest that the student group was less academically able as there was no material difference in the other teaching aspects of the subject content and presentation. These results reinforce that changing the assessment weighting is not sufficient to improve the relative (and absolute) performance of International students. The question then asked by the researchers was, "How are the lower marks scored by international students to be addressed?" and this study has highlighted that more work or modifications need to be made to the way in which the subject was taught. These changes need to encourage deep learning strategies for students in lectures, tutorial
exercises and assessment items.

- **How can educationalists encourage the adoption of a deep learning approach in students who have previously used mainly surface learning techniques? How can these be used to improve the learning outcomes for all students in the first stage finance subject under review?**

The research has shown that to change learning outcomes, teachers need to pursue strategies that encourage deep learning, and engage students in more active learning. The following section outlines the first group of changes that the teachers of the finance subject propose to make in the subject structure and ways in which they will engage students in deeper learning strategies.

**Strategies to be adopted by the teacher**

For deep learning to be promoted in the classroom it is essential that the teacher understands its meaning and implications and demonstrates its application. A demonstration may take the form of teachers modelling deep learning processes for students. This would demonstrate the process of learning, including taking a critical view and including some of the dilemmas that the questions may raise (Entwistle, 1990: 666). A teacher could either provide past students' assignment answers, from a surface learner compared with one from a deep learner, or provide students with model tutorial or exam answers as a demonstration for students (Biggs, 1990:71).

Deep learning is encouraged by teachers having a broad understanding and interest in the subject content, rather that teaching one part of the subject with limited knowledge of the rest of its topics. If current issues and applications of the subject matter are included in the learning program, students will more readily adopt the higher level of engagement of applying the learning material and relating it to a real world issue necessary for deep learning. In this study the convenor has begun to follow the content of the course as a whole and make additional connections of concepts that are covered across the three Modules within the finance subject under investigation. This is usually supported by feedback from employers or ex students of the subject being invited to speak about the skills that they apply in their job, the role the subject played in supporting those skills, and ways it could be improved. The provision of other career information may help students to make choices and to see the relevance of course material (Cassidy, 2000: 2).

For lecturers and tutors to have a well-structured knowledge base, they need to link the topics and refer to other parts of the subject content and to prior knowledge and understanding. This is one of the three key factors that determine the effectiveness of deep learning (see the section on Preference for Deep Learning). It requires that teachers are interested and able to understand student presage influences and learning levels. Assessment across topics is to be considered as a next step to linking topics and building on students' understanding. A Business Project could reinforce this by integrating the Modules of the subject in a problem solving assignment undertaken by students. The assignment will need to be carefully constructed and involve the relevant teaching staff responsible for content included in the assignment. The links between topics may need to be included in lectures and
tutorials before students' assessment includes crossing topic boundaries. In a subject at first level with a culturally diverse student group, the relevant knowledge base of students entering the subject is often diverse. Rectifying the diversity and inadequacy of student background knowledge could start by a small allocation of marks towards a test on 'current issues in finance' that would cover a broad range of current financial events relating to the course that appear in daily papers. Each student would submit one question to be considered for inclusion on the test.

It is crucial that assessment items reflect the requirement of deep learning. Items of assessment that require a significant amount of recall will be reduced to a minimum. These are assessments on which lectures and the textbooks provide the answers without students needing to understand the underlying concepts. Students will need to apply principles to new applications in the assessments. Similar applications will be practised in lectures and tutorial exercises. Student results on these 'application assessments' need to be monitored closely.

Changes to student practice

To reduce language problems facing international students, they will be encouraged to select specialist classes on a range of 'Learning Techniques' that are offered by the University. International students will be provided with contact names and details of 'English support' staff at the first lecture. Reminders to students who perform poorly in the early assessment items can reinforce the availability of the relevant facilities. It is essential that students are provided with the relevant information, and choose to be involved in English support programs.

Students will be able to select topics for assignments and group presentations as well as choosing the individuals they work with in group activities. This has already started but will be substantially extended. Each student chooses a question from the tutorial program on which they make a short presentation to the class, either in the groups for their Equity presentation and report or they may choose to present individually. There will be questions for students to choose from which present a range of student research. Students may select their own topic example from the financial media, or an extract from a short case study provided. Students could contribute to the assessment of the presentations. Peers could volunteer to assess the clarity of the content of a presentation and its relevance to the current Module. This is an important way of promoting student 'ownership' of the course material and the learning process.

To encourage students to understand the benefits of increased learner activity and deep learning more generally, they will be provided with an overview of how students learn in an attempt to increase awareness of 'meta-learning,' - or their own learning. The benefits and costs of deep learning will be discussed, with students contributing their own experience. This will be the focus of the first week of semester 2, when tutorials are not scheduled. Students will be encouraged to discuss the merits and demerits of deep learning. Students will be asked to identify ways that encourage them to participate. They could be asked to comment on techniques of involving students. Firstly the technique of the teacher 'naming' a student to illustrate an answer on the board (criticism in the Student evaluation comments, semester 1, 2000). Alternatively how they would respond to the following scheme. 'Everyone is to contribute to the tutorial, so you choose to answer or contribute where you feel able to.' Penalties for those who do not participate will only be introduced after testing the
'carrot' approach. A possible way of penalties would be to allocate 10 marks for contributions to class and from the 10 marks deduct marks for non-contributors. Selected student representatives could administer this.

Interaction with others will be encouraged by a tutorial program, which will almost exclusively take a problem solving approach, with many of these problems worked on in groups, mainly in class. Groups may debate, present answers, and perform a role-play or select a video to present to the class. (There is a series of videos on finance case studies produced by the Australian Institute of Banking and Finance). A role-play could depict an interview of a loan applicant with members of the Banks' Loan Department. This could reflect the role of bank officers, the credit assessment process, and the credit rating criteria applied. A student could volunteer to evaluate each performance.

The equity presentation and report will remain as an assessment, as it contains most of the key features of deep learning. The number in a group will remain at three as this number ensures that a passive member cannot be supported, as was the case with four students in a group (semester 1, 2000). The reduced number worked much better, both from the investigator's and other staff's observation, and from feedback from the students.

Learner activities can take many forms. Learning activities led by the teacher are useful for developing deep understanding. Activities demonstrated by members of the class are useful for elaborating and broadening understanding. Self-directed activities are useful for developing deep understanding, monitoring and self-assessing learning (Kwong Wong, 2001: 4). The suggested forms above need to be trialed and evaluated both by students and the teaching panel.

Conclusions

In Figure 1, Biggs (1999) shows the activities that may be used in the classroom to encourage students to change from passive to active learners. Most activities advocated in his schedule of 'Encouraging Deep Learning' are applied in the changes outlined above. 'Relating' and 'Applying' are encouraged in the problem solving approach taken in tutorials, and will be used as requirements in assessment items. 'Generating' includes students contributing to the subject's learning techniques and to assessment questions and mark allocation of peers. This is likely to be achieved in the requirement to write a play script, exploring and 'generating findings' from a chosen study. Whether students are able to 'theorise' is not so clear. This may be more suitable for second and third stage subjects.

Teachers need to continually 'reflect' on ways to promote deep learning, and they need to review and evaluate past practices. Requiring students to solve problems and contribute and assess various aspects of the subject encourages students to reflect. The proposed changes move a substantial distance towards the deep learning end of the spectrum.

It is not expected to be an easy transition for students who have been used to using surface learning techniques to adopt a deep strategy. Marton and Saljo (1976) found that it was relatively easy to induce students to adopt a surface approach but even when the teacher changed the type of question asked, and the expectation that students adopt a deep approach, it is more difficult. Some students may still
perceive that surface learning is adequate. This suggests that it may take some
time to successfully induce students to adopt deep learning strategies and there
may be some students who won't change. It is anticipated that a full adoption of
depth learning techniques may provide the practice to assist students to use deep
learning more successfully. This is supported by positive feedback from students
(informally), about the value of group problem solving since the size and the method
of selecting the groups has been refined.

Encouraging deep learning is consistent with the requirements of the work-place,
which advocate that employees are 'team players', and that they apply their
academic knowledge and skills to new applications, implying that they retain and
build on the knowledge and skills learnt previously. It is also consistent with the aims
of universities 'and yet are currently under-emphasised in the teaching methods
most commonly adopted' (Marton & Saljo, 1984: 54). Seventeen years later it is still
being espoused as a University objective, (Swinburne University of Technology,
2000), as a 'direction' not an achievement.

BIBLIOGRAPHY

for Lecturers and Supervisors, Australia: International Development Program of
Australian Universities and Colleges, Longman Cheshire.


Biggs, J. (1987), Student Approaches to Learning and Studying, ACER.

Biggs, J. (1990), Asian students approach to learning: Implications for teaching and

Biggs, J. (1991), Student learning in the context of school. J. B. Biggs (Editor),
Teaching for Learning, The view from Cognitive Psychology, Victoria: ACER.

Biggs, J. (1992), Approaches to learning of Asian students in Australia: A multiple
paradox. Symposium on student learning in a cross-cultural context. Fourth South-
East Asian Regional Conference.


Biggs, J. (1995), Student approaches to learning, constructivism and student-
centred learning. Twentieth International Conference on Improving University
Teaching, Hong Kong.

Biggs, J. (1999), Teaching for Quality at University, SRHE and Open University
Press.

Proficiency and Academic Achievements in Higher Education. Educational


Ramburuth, P. & McCormack. J. (1999), Learning diversity in higher education: A Comparative study of International and Australian students. (unpublished - the author sent a copy to the researcher by email. Page number references herein are reflective of those downloaded from the email.)


Swinburne University of Technology, Foresight and Planning Unit, 2000. Shaping Swinburne's Future Today - Statement of Direction 2010


