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Michael David Bromberg

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# **An Investigation into the Differing Success Rates of Management Accounting Students in Professional Accounting Examinations and Undergraduate Accounting Students Studying on Cognate Courses**

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**Michael David Bromberg**

**Submitted for the degree of Doctor of Education (Ed D) of the  
School of Education. University of Durham, October 2007.**

26 JAN 2009

*'We all love to instruct; though we can teach only what is not worth knowing'*

*(Jane Austen, Pride and Prejudice)*

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## **Abstract**

### **An Investigation Into The Differing Success Rates of Management Accounting Students in Professional Accounting Examinations and Undergraduate Accounting Students Studying on Cognate Courses**

**M D Bromberg**

This dissertation is concerned with the issue that students studying part-time for professional accounting examinations - specifically those in management accounting of the Association of Chartered Certified Accountants (ACCA) - at a London university suffer much higher failure rates than their counterparts taking degrees in Accounting at the same institution, who are entitled to exemptions from many of the professional accounting papers. Utilising the 'Student Approaches to Learning' (SAL) methodology, the differences between the students are examined in terms of factors affecting the presage to learning, the learning process, and the product of learning.

Differences between the groups in terms of presage factors and approach to learning were generally found to be small. The key difference between the groups was assessment: the undergraduates faced assessments set by their teachers, normally had coursework, with the possibility of re-sitting failed assessments, and had a lower pass mark than their part-time counterparts. Despite this, the undergraduates displayed a more strongly surface approach to learning than the part-time students.

The quality of product of the part-time students was assessed. A mind map of key areas of management accounting understanding based on past syllabi and examinations was prepared as a benchmark. Performance against the benchmark was established using two case studies. In both cases the students achieved SOLO levels indicating a uni- or multi-structured level of understanding of the subject. There was little evidence of a relationship between learning approach as measured by the ASSIST instrument and performance in solving the case studies. An analysis of examination performance by part-time students revealed a (negative) relationship between a surface approach and examination mark but no relationship between deep approach and mark.

## ***Declaration***

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*All information derived from this thesis must be acknowledged appropriately.*

## **SECTION ONE - INTRODUCTION**

# Chapter 1 – Introduction

## 1.1 THE ACCOUNTING PROFESSION IN THE UK

In 2006 there were 270,105 qualified accountants in the United Kingdom and Republic of Ireland - members of the six chartered accountancy bodies<sup>1</sup> who form the UK Consultative Committee of Accountancy Bodies (CCAB). These bodies also had 159,754 registered students (Professional Oversight Board, 2006). The two largest bodies, the Association of Chartered Certified Accountants (ACCA) and the Institute of Chartered Accountants in England and Wales (ICAEW), contained about 60% of the total membership and the former body – the subject of this dissertation – more than 70% of the students. The profession is experiencing a period of considerable growth; overall the membership figures showed a 13.9% increase in the five years prior to 2006. The UK accounting bodies are also important internationally; the ACCA had more than 170,000 members outside the UK and Ireland in 2006.

The UK accounting profession is a significant player on the world stage; the number of qualified accountants in the UK is five times bigger than the combined total in France, Japan, and Germany and contains more than half the number in the US with its much larger population (Nobes, 1996).

But, despite this apparent success, the profession has not been without its problems. A series of business failures over the years has led to continuing criticisms of the accounting profession, though much of the criticism was based on a misunderstanding of the auditor's role. The public expected the profession to protect it against fraud by owners of failing companies, something no auditor could possibly achieve. Of more concern is the direct complicity of the auditors in the recent Worldcom scandal and the conviction – later overturned – of those in the Enron bankruptcy.

Alongside problems about the accounting profession, accounting education has also provided a source of concern. Changes in the regulatory environment, and the revolution in information processing that occurred in the second half of the twentieth century, caused

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<sup>1</sup> Association of Chartered Certified Accountants (ACCA)  
Chartered Institute of Management Accountants (CIMA)  
Chartered Institute of Public Finance and Accountancy (CIPFA)  
Institute of Chartered Accountants in England and Wales (ICAEW)  
Institute of Chartered Accountants in Ireland (ICAI)  
Institute of Chartered Accountants of Scotland (ICAS)

enough disquiet amongst both accounting academics and professional accountants that they came together in the US in 1989 to set up the Accounting Education Change Commission to improve the academic preparation of accountants (Sundem, 1999). Despite the work of the Accounting Education Change Commission, the number of US college students majoring in accounting halved between 1990 and 2000 (Gabbin , 2002) and the title of an influential work by Albrecht and Sack (2000) - *Accounting Education: Charting the Course through a Perilous Future* - tells its own story of perceived problems within the field of accounting education.

## 1.2 BACKGROUND TO ACCOUNTING EDUCATION

This dissertation will be concerned with the study of accounting within a UK university environment. The teaching of subjects related to professional qualifications is a relatively recent phenomenon in UK universities; whilst continental universities traditionally considered their role as embracing teaching of the professions, historically the UK universities limited their remit to preparing students for entry to the church. Professional qualification generally came through some form of apprenticeship. Although growth in academic status for most of the professions began to arrive in the late nineteenth century, the first academic department of accounting did not grow out of the LSE's economics department until the 1930s and the first accounting degree, at the City of London Polytechnic, was not validated until some forty years later.

Each professional body is responsible for the education of its own members; maintaining a set of examinations leading to associate membership of its institute. Students also have to demonstrate practical experience of performing accounting work. The relationship between the six senior UK accounting bodies and the universities is separately negotiated between each accounting body and each university, though the National Qualifications Authority of Ireland recently recognised the ACCA qualification as of equivalent standard to a Master's degree<sup>2</sup>. Although this series of relationships has the potential for a degree of confusion, in practice the form and nature of the links is well established and has worked well for many years.

The professional bodies give credit to students, who come from recognised universities and have passed specified courses, against named papers within their own qualification structure. Some universities grant entry with advanced standing to students who have completed their

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<sup>2</sup> Letter dated 4 March 2008 in author's possession

professional accounting examinations. For example Strathclyde runs an MBA specifically for members of the Chartered Institute of Management Accountants (CIMA) and Oxford Brookes allows students who have completed the intermediate stage of the ACCA examinations to gain an undergraduate degree by preparing an appropriate dissertation.

The overall effect is that two parallel networks of qualifications exist, one within and one outside the higher education institutions (HEIs), though with a regulated degree of movement between the two. Some students study full-time for accounting degrees and gain exemptions for examinations that other students are studying for part-time, often at the same institution. Table 1-1 shows the structure of the ACCA's examinations in 2006 with a number of possible student entry routes. Students with a non-relevant degree or 'A'-levels start the first paper 'Preparing Financial Statements' numbered 1.1. Graduates with a relevant degree - that is a degree at least in part cognate with the ACCA's examination structure - gain exemption from some of the that body's examinations and normally enter somewhere between papers 2.3 and 2.6, depending on the exact modules they have studied as a part of their university degree. Nobody is allowed any level three – papers from 3.1 to 3.7 – exemptions. Prospective students without qualifications can gain entry to the ACCA's examination structure at the start of level two - paper 2.1, Information Systems - by first completing one of the intermediate level, accounting technician, qualifications, either the Certified Accounting Technician (CAT) or Association of Accounting Technicians (AAT) awards, both of which have open admission regardless of age and prior qualification.

**ACCA  
Modules**

**Entry Requirement**

1.1	Preparing Financial Statements	}		<<	Non-relevant Degree <i>or</i> Over 18 with A Levels <i>or</i> over
1.2	Financial Information for Management	}	Level One		
1.3	Managing People	}			
2.1	Information Systems	}		<<	Certified Accounting Technician Qualification (Can enter at 16 with no qualifications)
2.2	Corporate & Business Law	}			
2.3	Business Taxation	}	Level Two	<<	Relevant degree: exact entry
2.4	Financial Management and Control	}		<<	point depends on modules
2.5	Financial Reporting	}		<<	taken during degree
2.6	Audit & Internal Review	}		<<	
3.1	Audit and Assurance Services (Option)	}			
3.2	Advanced Taxation (Option)	}			
3.3	Performance Management (Option)	}			
3.4	Business Information Management (Option)	}	Level Three		
3.5	Strategic Business Planning and Development (Core)	}			
3.6	Advanced Corporate Reporting (Core)	}			
3.7	Strategic Financial Management (Core)	}			

**Table 1-1 - Structure of ACCA course showing entry points for students with different qualifications**

### 1.3 BACKGROUND TO THE STUDY

In September 2002 the author of this dissertation commenced employment at a London university after more than twenty years experience of teaching in other HEIs. His role was to take charge of the Association of Chartered Certified Accountants (ACCA) course, offered part-time to students studying for examinations set and marked by the ACCA. The post also involved teaching two evening classes on the programme.

An important issue immediately became apparent that affected both the author's university and many other comparable institutions. As Table 1.1 demonstrates, considerable numbers of students are able to gain entry to the ACCA examination regime by taking advantage of exemptions gained as a result of having passed their degree. Table 1-2 illustrates the potential scale of this transfer activity; taking only universities directly comparable with the one in this study – post-1992 universities (former polytechnics) based in London – the table illustrates the level of exemption available to students from these institutions if they move to the ACCA programme. This pattern of exemptions is repeated both nationally and internationally. The effect is that many thousands of students enter the ACCA qualification structure at a relatively high level as a result of having passed university based assessments.

<b>Institution</b>	<b>Course</b>	<b>Maximum Exemption</b>
<i>London Metropolitan University</i>	BA Accounting and Finance	Up to F9
<i>Middlesex University</i>	BA Accounting and Finance	Up to F9
<i>South Bank University</i>	BA Accounting and Finance	Up to F8
<i>Thames Valley University</i>	BA Accounting and Finance	Up to F9
<i>University of East London</i>	BA Accounting and Finance	Up to F9
<i>University of Greenwich</i>	BA Accounting and Finance	Up to F9
<i>Westminster University</i>	BA Business Studies	Up to F7

**Table 1-2 – Maximum Exemptions Available for Students from Post-1992 London Universities on ACCA Programme**

Naturally, this is not problematic if there is exact equivalence between the ACCA's examinations and their university-based counterparts. The ACCA check carefully to ensure that university examinations are cognate with their own versions but pass rates provide a source of concern. Students examined by the ACCA, whatever their mode of study, can expect to fail their examinations. In the ten diets of examinations up to December 2007, when there was a change of syllabus, no single ACCA paper had an average pass rate higher

than 52% and the average for all papers and diets was 47%<sup>3</sup>. Since successful students have to pass fourteen papers, this represents a very significant overall failure rate. In contrast, most undergraduates, normally around 75% of entrants, eventually gain a degree. The success rate for Master's degree students is even higher, around 90% of entrants leave with a degree. These figures apply both nationally and in the institution under consideration.

The reason for this difference in success rates is not immediately obvious. The undergraduates are studying on modules which are cognate with, and likely to qualify them for exemption from, examinations that the ACCA students are attempting to pass, so there is no *a priori* reason for the difference in success rates.

#### **1.4 THE STUDY**

Clearly, a more systematic, scientific study of the problems associated with the success rates of part-time professional accounting students was demanded and this dissertation is the result of that study. The overwhelming majority of studies concerning student learning have focused on full-time undergraduates and postgraduates; this applies equally to the literature on learning accounting. Despite the large, and increasing, number of part-time students - including those studying for professional qualifications - in HEIs, understanding how these students learn and how they might be integrated into the academic community is an area largely absent from the academic literature.

The ACCA students selected for the study were taking the management accounting modules (Financial Information for Management, paper 1.2 and Financial Management and Control, paper 2.4) taught by the author. The group selected for comparison with them comprised full-time undergraduates studying modules cognate with the courses taken by the ACCA students. Most of them would gain a BA in Accounting and Finance, entitling them to entry to the ACCA set of examinations at the start of the third level, i.e. paper 3.1, and thus exemption from the two management accounting modules.

#### **1.5 AIMS**

The primary aim of this dissertation is to seek to understand why two groups of students, one studying part-time on a course preparing them for the examinations of the Association of Chartered Certified Accountants (ACCA) and one studying full-time on cognate courses for internal university assessment, display significantly different success rates.

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<sup>3</sup> [http://www.accaglobal.com/students/study\\_exams/exams/passrates/professional\\_scheme](http://www.accaglobal.com/students/study_exams/exams/passrates/professional_scheme)

## 1.6 STRUCTURE

Section 2 examines research into student learning in higher education in general and then accounting in particular. This research informed the factors that were considered and the methodology employed. The appropriate content of a course in management accounting and the level of expertise attained by successful students is a concern; it forms an important background to the study and provides a benchmark against which management accounting knowledge and expertise can be measured. Section 3 deals with management accounting as a subject. Section 4 describes the methodology, which involved use of both quantitative and qualitative techniques: a questionnaire, a series of semi-structured interviews, analysis of student performance in formal assessment, and the analysis of the performance of a sample of students in tackling a pair of specially designed case studies. Section 5 provides details of the results and a discussion. Section 6 draws conclusions, and makes some suggestions for further research.

To summarise:

- 1) The study aims to understand why students studying for externally set professional examinations perform less well than students taking internally set but cognate university examinations.
- 2) The learning of the two groups of students concerned will be considered in the context of two management accounting examinations set and marked by the ACCA: Financial Information for Management (Paper 1.2) and Financial Management and Control (Paper 2.4) as compared with cognate courses within the university's modular undergraduate degree framework.
- 3) There has been little previous work on the learning of either part-time or professional course students so this dissertation will form a valuable contribution to the literature.
- 4) The body of the study analyses the learning literature, compares the learning of part-time and full-time students, investigates how the students go about learning using a case study approach, and arrives at some conclusions in respect of differences between the student groups.

## **SECTION TWO – LITERATURE REVIEW**

# Chapter 2 – Research into Student Learning in Higher Education

## 2.1 INTRODUCTION

The literature on learning in higher education has recently been summarised by Coffield, Moseley, Hall, and Ecclestone (2004). They analysed the thirteen most influential models currently used in the analysis of post-16 education. A dichotomy emerges from Coffield *et al.*'s analysis: ten of their models reflect characteristics unique to the individual learner; the second category takes a broader view of learning, less reliant on the individual and taking more account of the learning situation in general.

The dichotomy identified by Coffield *et al.* echoes a continuing debate within higher education learning theory, which has been dominated by two conceptually related paradigms - 'trait' versus 'strait' (Watkins, 2001). The first assumes that every learner has a distinct learning style determined by personality, constitution, cognition, or learning preference. The second, the 'Student Approaches to Learning' (SAL) framework, takes approach to learning as resulting from a combination of factors, involving the student, the teacher, and the learning situation. The next two sections discuss the models of learning in higher education in more detail; section 2.2 focuses on the 'learning style' models where the focus is on the student, section 2.3 on the SAL framework.

## 2.2 LEARNING STYLE THEORY

Learning style is '*a predisposition on the part of the learner to adopt a particular learning strategy*' (Schmek, Ribich, and Ramanaiah 1977, p413). Researchers have identified in excess of thirty different learning styles (Riding and Cheema, 1991). Although most of the styles were developed independently, later researchers began to group styles together; Shmeck (1988a) commented that '*I feel that all cognitive styles can be encompassed by one broad inclusive dimension of individual differences labelled 'global vs analytic' by Kirby*<sup>4</sup>,

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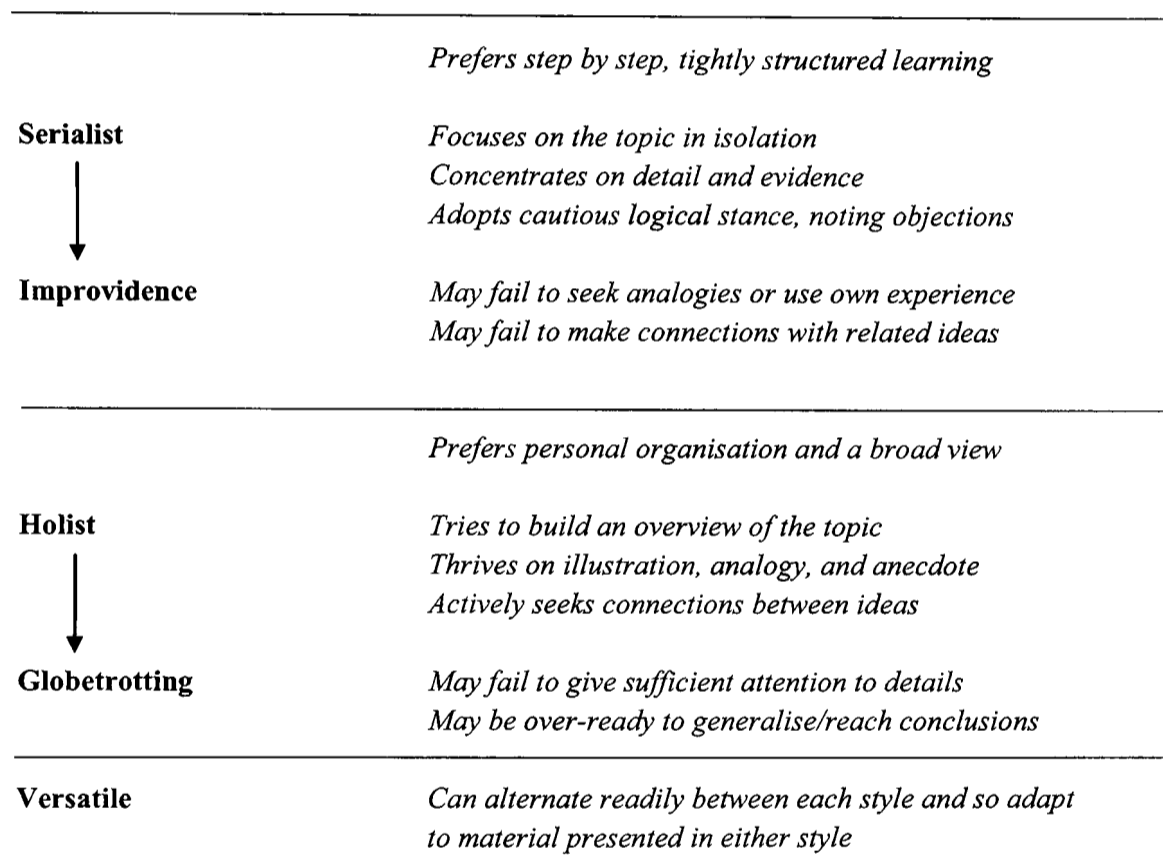
<sup>4</sup> Chapter 9 in Schmeck (1988b)

*'holist versus serialist' by Pask<sup>5</sup> and 'right versus left-brained' by Torrance and Rockenstein<sup>6</sup>.*

Serialist and holist styles are discussed below by way of illustration; a description of the inventories follows.

### 2.2.1 SERIALIST/ HOLIST

The serialist (Figure 2.1): takes a step-by-step, highly structured approach, focusing on each topic in isolation; she concentrates on details and on the evidence and *'adopts a cautious logical stance, noting objections'* (Entwistle, McCune and Walker, 2001); the holist takes a broad overview of a subject, looks for a connection between ideas, and *'thrives on illustration, analogy, anecdote'* (op. cit.).



**Figure 2-1 – Description of the way serialist and holist learning styles can lead to defective learning, whilst versatile learning is the optimal style (Pask1976, Adapted)**

Pask (1976) used the serialist-holist dimension to differentiate between serial and holistic learners, and versatile learners, who were able to switch styles with ease. As Figure 2-1 indicates, excessive use of the serialist strategy can lead to improvvidence; excessive use of the holist strategy to globetrotting. The serialists were unable to create a whole from the parts, the holists tended to jump to premature conclusions or unjustified generalisations.

<sup>5</sup> Chapter 4 in Schmeck (1988b)

<sup>6</sup> Chapter 10 in Schmeck (1988b)

### 2.2.2 LEARNING STYLE INVENTORIES

Learning style theory has generated a number of psychological inventories used to assess students' learning style, of which the best known are Kolb's Learning Style Inventory (LSI) - based on Kolb's Experiential Learning Model (ELM; Kolb, 1976, 1984) - and Honey and Mumford's Learning Styles Questionnaire (LSQ; Honey and Mumford, 1986). Although there have been many successful tests (Kolb, Boyatzis, and Mainmelis, 2001) to show that learners group into the four learning style categories identified by the ELM (concrete experience, reflective observation, abstract conceptualisation, and active experimentation), there have also been significant criticisms of the approach based on structure (Freedman and Stumpf, 1978; Jervis, 1983; Wilson, 1986; Rogers, 1996), reliability (Kolb, 1981; Hickox, 1991; Iliff, 1994), and psychological validity (Reynolds, 1997). DeCoux (1990) concluded '*in spite of wide acceptance of Kolb's LSI, little support for its validity or utility is apparent*' and '*the instrument does not display sufficient validity and reliability to warrant its current popularity*' (pp 206-207).

The LSI has been widely used in accounting education research in the US; Baker, Simon, and Bazeli, 1986; Baker, Simon, and Bazeli, 1987; Brown, and Burke, 1987; Collins, and Milliron, 1987; Togo, and Baldwin, 1990 all employed Kolb's LSI to capture students' learning behaviour. These learning style studies - reviewed in Rebele, Stout, and Hassell (1991) - compare the learning styles of accounting students with those of students in other disciplines and/or with practising accountants, or attempt to explain differences in academic performance, particularly in first-year accounting subjects. This literature has been unable to establish the presence of a consistent learning style amongst accounting students. This inconsistency is not surprising given the inability of Kolb's LSI to capture students' learning style adequately. The psychometric limitations of Kolb's LSI led Stout and Ruble (1994) to comment that

*'four independent studies .... found divergent results regarding the factor structure of the LSI-1985. These studies indicate that the LSI-1985 lacks a coherent structure necessary for construct validity. Further, the two-factor solutions that were obtained from these data sets yielded evidence that is not consistent with predictions based on Kolb's ELM.'* (p94)

and concluded that:

*'we find no empirical support for the validity of the LSI-1985, either in its standard form or in a modified (scrambled) form. Thus, we recommend suspension of the use of this instrument in accounting education research.'* (p101)

Similarly, Duff (2004a) in the UK, commenting specifically on the role of cognitive learning styles in accounting education, concluded that *'[Kolb's] ELM is unsuitable for applied research until a measure producing scores of satisfactory psychometric properties is created'* (p38).

The Learning Styles Questionnaire (LSQ) is based on the LSI; concerns about its psychometric properties have also been raised. It has been criticised for failings in construct validity and has sometimes failed to show significant correlations amongst its four learning styles: activist, pragmatist, reflector, and theorist (Goldstein and Bokoras 1992; Tepper, Tetrault, and Romero, 1993). Hudak (1985) noted the four styles are of questionable validity since the learning style construct itself has not been demonstrated to have relevance. Duff and Duffy (2002) concluded that the LSQ was not an acceptable alternative to the LSI and its use in the field of higher education was premature.

Given the strong criticisms associated with learning styles theory, its use was not pursued for the purposes of this study. The next section discusses Student Approaches to Learning in more detail; it has generally superseded learning styles as a body of theory, certainly outside the United States.

## **2.3 STUDENT APPROACHES TO LEARNING (SAL)**

### **2.3.1 INTRODUCTION**

It is possible to see a development from the research into learning styles that led on to creation of the Student Approaches to Learning framework. In particular, the serialist/holist dimension (Pask and Scott, 1972) contributed significantly to development of a series of instruments measuring student approach to learning.

Student Approaches to Learning (SAL) provides an alternative vision to the learning styles methodology. Richardson (2000) suggested this way of understanding student learning has become *'perhaps even a cliché in discussions about teaching and learning in higher education'* (p27) and Solomonides and Swannell (1998) that *'"Approach to Study" is*

*becoming one of the principal genre [sic] by which student learning can be studied and explained' (p 371).*

As compared with the learning styles literature, SAL regards learning as contextual; learners will choose the most appropriate learning strategy given both their own personal psychological preferences and the task to be undertaken. *'Extensive research studies have been conducted into the relations between students' perceptions of their learning environment and their approaches to learning... results suggest that ... approaches to learning are relational'* (Trigwell, Prosser, Ramsden, and Martin 2000, p 97). Prosser and Trigwell (1999a) described the approach as unitary and constitutionalist, meaning they do not accept the dualism inherent in information processing theories but take the student and world as being constituted from the same whole. It is also constructivist *'Broadly speaking the research rests on a constructivist perspective'* (Lucas and Mladenovitch, 2004; 399).

The earliest studies took a phenomenographic approach – studying students' responses to a learning task without making any presumptions about how they would learn. Later the phenomenographic studies were supplemented by a quantitative approach utilising a series of psychological instruments or inventories, described in more detail below.

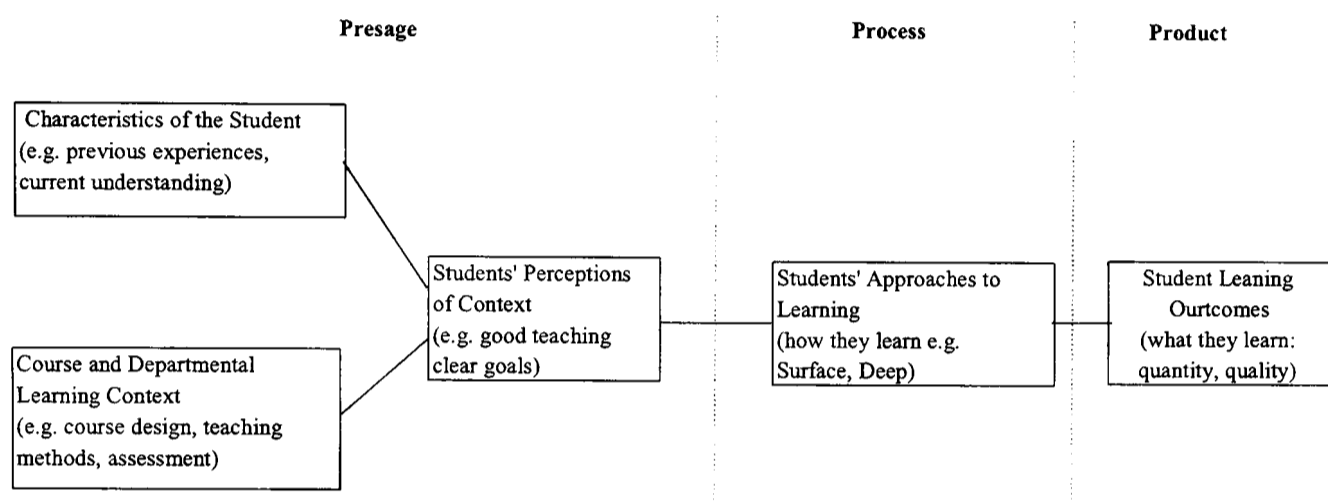
Two conceptual underpinnings provide academic support for Student Approaches to Learning. The 3-Ps (presage/process/product) model explains how students' approach to learning is affected by their background, the learning context, and the task being attempted, whilst the Structure of Observed Learning Outcomes (SOLO) provides a tool capable of analysing the quality of learning achieved by students. These topics are also discussed in more detail below.

This dissertation seeks to understand why two groups of students studying on cognate courses achieve quite differing results. Student Approaches to Learning suggests that an analysis of presage factors and approach should help understand this difference in product.

### 2.3.2 THE THREE PS MODEL

Biggs' 3- P's (presage, process, product) model, (Ramsden, 1992; p83: Figure 2-2, based on Trigwell and Prosser, 1996) summarises the approaches to learning conceptual framework. Developed by Biggs (1978, 1987) from work by Dunkin and Biddle (1974), it emphasises elements of the learning experience whereby students' orientation to study is affected both by their previous experience and by the learning context. The model focuses on

characteristics of the learner and the learning context (presage), these in turn affect students' perception of the requirements of the task to be undertaken and therefore their approach to learning (process) and so the outcome of that learning (product). Although the model is often described in a serial fashion - presage leading to process and thence to product - in its original form (Biggs, 1993), learning was perceived as an organismic system (Bertalanffy, 1968); connections within it operate in both directions, with the implication - as with all such systems - that changes to any part of the model may result in changes unpredictable in nature and direction to any other part or parts.



**Figure 2-2 – The Presage/Process/Product Model, showing how within the SAL framework outcome, the product, depends on presage factors, which affect the student's perception of the context of learning, and therefore the process of learning (Trigwell and Prosser, 1996)**

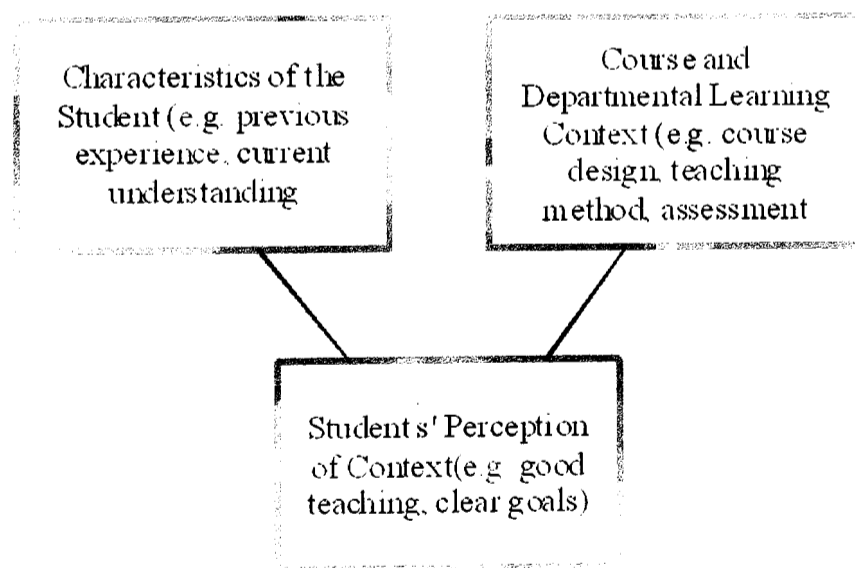
The next four chapters examine the SAL literature: Chapter Three on presage factors, Chapter Four on the learning process, and Chapter Five on the relation between approach and process - the product. Chapter Six summarises the approaches framework and discusses criticisms of it. Chapter Seven follows the presage, process, product sequence in relation to the literature on learning within accounting as a subject.

# Chapter 3 - Presage Factors

## 3.1 INTRODUCTION

Within the context of this study, the two groups of students under consideration display different learning outcomes. If the approaches to learning methodology is relevant in this case, the outcome of learning should be caused by - or at least related to - differences in approach to learning, in turn related back to differences in presage factors. Approach to learning is broadly categorised either as deep – the student intends to engage with the material, aiming to completely understand it – or surface – the student aims to be involved with the material only sufficiently to reproduce it in order to pass an examination or other form of assessment. This chapter examines the various presage factors with a view to identifying those most relevant for future study.

Two kinds of presage factors are evident in the 3-Ps model (Figure 3-1): characteristics of the student and course and departmental learning context, the two combining to develop the student's perception of the learning context. Each of these is discussed in turn in the next two sections.



**Figure 3-1 – The Presage section of the 3Ps Model – extract from Figure 2-2**

## 3.2 STUDENT CHARACTERISTICS

### 3.2.1 INTRODUCTION

Over the years, Biggs has identified a number of examples of ‘personological’ presage factors, the student’s characteristics: cognitive style, personality, IQ, home background (Biggs, 1979); ability, locus of control, experience, personality, home background (Biggs, 1985); prior knowledge, ability motivation, conceptions of learning (Biggs, 1989). Dunkin and Biddle (1974) had previously identified ‘*three demographic and background variables ... in the presage list: age, sex, and.... experience*’ (p.411).

Many of these factors: age, sex, experience, and the student background factors, are factual and relatively easily measured. Motivation will be seen to be measured directly by the instruments assessing approach to learning.

Neither cognitive style nor ability (IQ) has been directly measured in this study. The former for the reasons discussed in section 2.2 and the latter because IQ is a much criticised concept (Jay, 1981) and difficult to assess accurately in a heterogeneous group of students. Locus of control, personality, and conceptions of learning are discussed in the next three sections.

### 3.2.2 LOCUS OF CONTROL

Wilhite (1990) showed that the student who perceives she has control over her own learning - has a strong internal locus of control - will demonstrate superior academic performance. Similarly, *self-efficacy* - the belief in one’s own ability - is also an important predictor of successful learning. Zimmerman (1990) reported it as the key to students’ motivation. Watkins (2001), in a cross-cultural meta-analysis, reported that locus of control and self-esteem correlate with the approach a student takes to learning. Students with greater confidence in their own learning capacity are more likely to adopt a deeper approach to learning.

### 3.2.3 PERSONALITY

The most commonly used framework to assess personality type is derived from Jungian analysis and comprises three scales along which personality is measured: extraversion – introversion (EI), sensing – intuition (SN), and thinking – feeling (TF); to these three Briggs and Myers (Myers, 1990) added a fourth: judging – perceiving (JP). The most frequently

used psychological inventory (Carroll 2003), the Myers-Briggs Type Indicator (MBTI), measures personality as a combination of these four scales. Each type is usually denoted by one of the four initials to represent an individual's personality according to each of the four scales. For example, INTJ would stand for 'Introversion, Intuition with Thinking and Judging'. Personality is discussed further in section 7.2.1.8.

### 3.2.4 CONCEPTIONS OF LEARNING

The way students conceive of learning provides one of the most significant factors affecting their approach to study. Many studies across a range of disciplines have concluded that students start with a simplistic notion of learning that develops as they move through their course. Säljö (1979) worked on the basis of individual interviews and study sessions with a sample of 90 people concerning their approaches to learning. His sample was selected according to two criteria: age (which ranged from 15 up to 73 years) and level of education (a minimum of 6 years and a maximum of 16/17 years). The result was a set of five conceptions of learning which have strongly influenced subsequent literature on the subject:

- The increase of knowledge
- Memorizing
- Acquisition of facts, procedures etc.
- Abstraction of meaning
- Interpretation aimed at the understanding of reality

Students holding a view of learning that fits into one of the first three of these categories have generally been seen as holding a quantitative view of learning (more is better); those in the final two categories have a view of learning that represents a qualitative change in the individual and her perception of the world.

Marton, Dall'Alba, and Beaty (1993) in the UK worked with twenty nine Open University undergraduate students - falling to three by the end of the course - randomly chosen from a group starting a Social Science foundation course. Working phenomenographically on the basis of interview transcripts, they matched the five Säljö conceptions precisely but a final one, '*changing as a person*' emerged from their analysis. The students were interviewed over the six-year period of their course and Marton *et al.* were able to demonstrate that students tended to move towards the final two categories during the period of their studies. Although most students showed a tendency to move to a less quantitative view of learning

over the period Marton *et al.* commented that *'we do not find it meaningful to speculate about developmental trends at the group level'* (p296).

This final conception of learning *'changing as a person'* reflects the idea of a threshold concept (Meyer and Land, 2006), something that for the student *'fundamentally changes their way of thinking about their own choices, as well as serving as a tool to interpret the choices made by others'* (p6).

If increase in knowledge counts as one on a Likert scale, and changing as a person six, Taylor (1994) in a study of 884 students from a range of disciplines found the 43 postgraduates in the sample had an average score of 3.4, the remaining (undergraduate) students an average of exactly three, that also being the rating of the group as a whole. Thus the students had, on average, a quantitative view of learning.

Rozendaal, De Brabander, and Minnaert (2001) - though working with secondary school students - found those with a more qualitative view of knowledge were more meaning directed in their learning. Students with a more quantitative view of knowledge were more likely to report reproduction-directed and undirected learning patterns. Dart, Burnett, and Purdie (2000) summarised the position:

*'if teachers require their students to develop meaning and understanding of their subjects through deep approaches to learning, then students must hold qualitative or experiential conceptions of learning'*. (p265)

### **3.3 CONTEXTUAL PRESAGE FACTORS**

#### **3.3.1 INTRODUCTION**

The second group of presage factors found in the literature to contribute to the student's approach to learning includes those affecting the context in which learning takes place. The most important contextual factors having an effect on approach to study are likely to be those relating to the course of study (including the type of assessment), the teacher, and the level at which the course is being taught. For the present investigation, the courses under consideration are all intended to generate expertise in management accounting and are taught at the same institution, though the assessment regime faced by professional course and undergraduate students is quite different. Although there is some commonality between the teaching staff on undergraduate and professional courses, in practice almost all the ACCA

students being studied here were taught by the author and the undergraduates by a range of other teachers. The extent to which the academic content of the courses is identical is a matter for empirical research and is discussed in Chapter Ten; the literature about teaching style is discussed in section 3.3.3 below.

### 3.3.2 FACTORS LEADING TO A DEEP OR SURFACE APPROACH

Svensson (1977) found that students will tend to adopt a deep approach if they acknowledge the abstraction involved in higher education and Fransson (1977) if the syllabus interests and motivates them; they will tend to a surface approach if the curriculum is heavy and assessment inappropriate (Dahlgren and Marton, 1978). Gibbs (1992) summarised the factors leading to surface learning (Biggs, 1989; Crooks, 1988; Ramsden, 1987):

- a threatening and anxiety-provoking assessment system;
- a heavy workload;
- an excessive amount of course material;
- a lack of opportunity to pursue subjects in depth;
- no freedom to choose the subjects to be studied; and
- lack of choice over the method of study.

Watkins (1982a) surveyed 199 first year students in a range of disciplines and found that a deep approach was encouraged by interest in the subject, a desire for good grades, essay questions - but not multiple choice (Entwistle, 1998) - and enthusiasm on the part of the teacher. A surface approach was generally engendered by lack of time. Watkins also looked at 292 senior year students: for them a deep approach was encouraged by a challenging but not over burdening course, which encouraged independence of attitude and approach.

Students typically spend the same amount of time on learning in different subjects so more contact time and heavier workloads lead to less deep learning. Conversely greater student choice leads to more deep learning (Entwistle and Ramsden, 1983) as does approachability of the teacher. Ramsden (1997) quoted a student '*I find the courses I do most work on are the courses where I get on with the tutors best*' (p205).

### 3.3.3 TEACHING AND APPROACH

The approaches to learning viewpoint brought with it a relativistic philosophy of teaching conceptually different from the traditional view of the teacher as a transmitter of information

(Prosser and Trigwell, 1999a). The descriptions of student learning have parallels in the style of academic teaching. Most general are the *conceptions* of teaching; *styles* of teaching derive from teachers' personalities.

### 3.3.3.1 CONCEPTIONS OF TEACHING

A considerable number of studies (e.g. Samuelowicz and Bain, 2001; Murray and MacDonald, 1997) and Kember (1997) - the majority utilising phenomenographic techniques - have investigated teachers' conceptions of learning. They found from investigation of teachers' stated objectives about their teaching that those objectives normally lie along a scale from transmitting information to conceptual change in the student; between two and five categories along this dimension have typically been observed in the studies. Entwistle, 1998 detailed teaching objectives for three of the teachers' conceptions of learning (Table 3-1).

#### *Teacher Focus*

##### *Information Transfer*

Conveying information and covering the syllabus  
 Making sure that necessary knowledge and skills are acquired  
 Maximising the general level of performance of the class

##### *Conceptual Understanding*

Developing conceptual understanding and employment related transferable skills

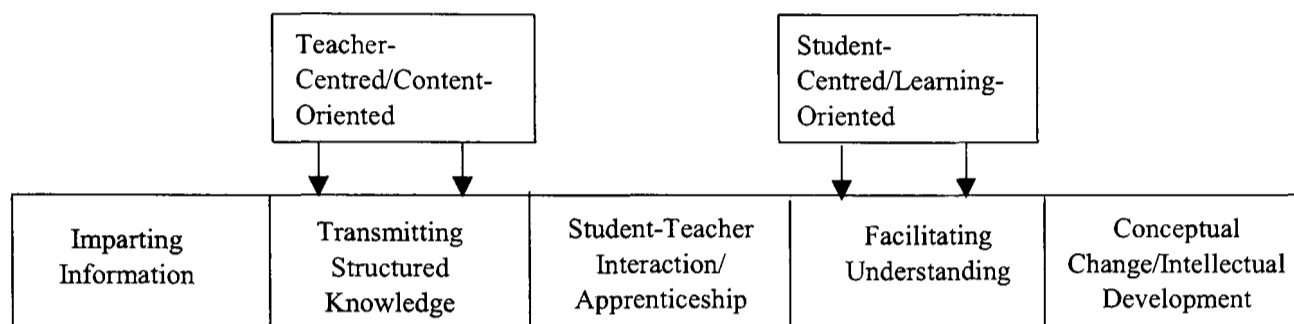
##### *Conceptual Change*

Awakening and maintaining students' interest in the subject  
 Encouraging students to think independently and imaginatively  
 Helping students to develop personal and social skills, and a broader perspective on their future life and vocation

#### *Student Focus*

**Table 3-1 – The relationship between teaching objectives and conceptions of learning. (Entwistle, 1998)**

Kember (1997) in a meta-study related the content and student centred views of teaching with the conceptions of learning held by teachers (Figure 3-2). Kember contrasted the schoolteacher, whose focus is student-centred/learning oriented and the university academic whose aim is to convey knowledge or expertise relevant to a specific discipline or profession. Novak and Gowin (1984; Figure 3-3) provided a contrast to Kember’s parallel view of the relationship between depth and teaching style; here depth, described along an axis from *meaningful learning* to *rote learning*, is orthogonal to teaching style, along an axis from reception learning to discovery learning.

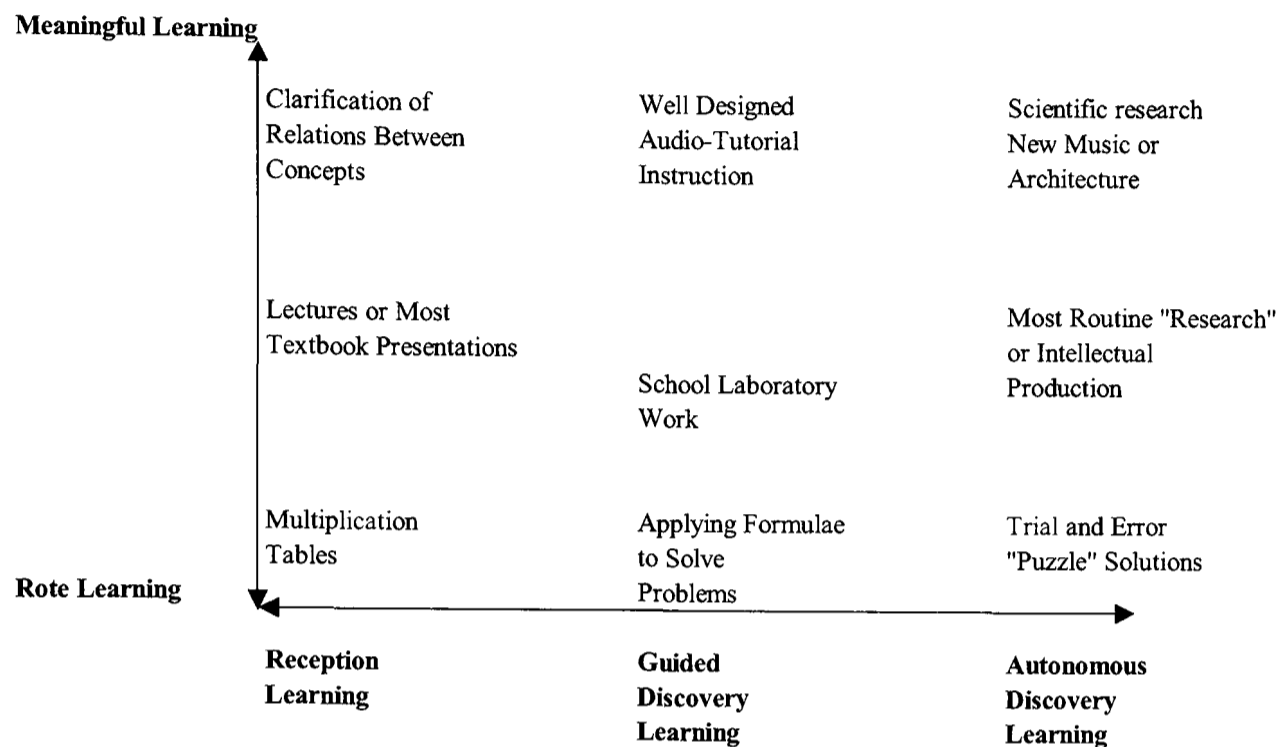


**Figure 3-2 – As with Table 3-1, Kember (1997) in a meta-study found that teachers focused on the subject concentrated on imparting information; those focused on**

The distinction between Kember and Novak and Gowin is fundamental to an understanding of student learning. If Kember is correct, there is a direct association between teaching style and depth of learning. Implicitly, only one view of teaching will be successful in producing deep learning; if the Nowak and Gowin view is correct, there is no such relationship, deep learning can result whatever the style of teaching.

Support for Novak and Gowin came from Kirschner, Sweller, and Clark (2006), who pointed out that there is no empirical evidence for the success of ‘*minimal guidance instruction*’ and that imparting supporting knowledge is fundamental to successful learning. Whilst approach to teaching is not necessarily a fundamental part of the student approach to learning framework, this lack of evidence raises a significant question mark over the theoretical basis on which the whole edifice has been constructed.

The relationship between teaching and learning styles extends beyond individual academics to whole departments. Gow and Kember (1993, Kember and Gow 1994) found a tendency for students in University departments where teacher centred learning was the norm to surface learn whilst the student development end of the scales of Tables 3-1 and 3-2 was associated with deep learning.

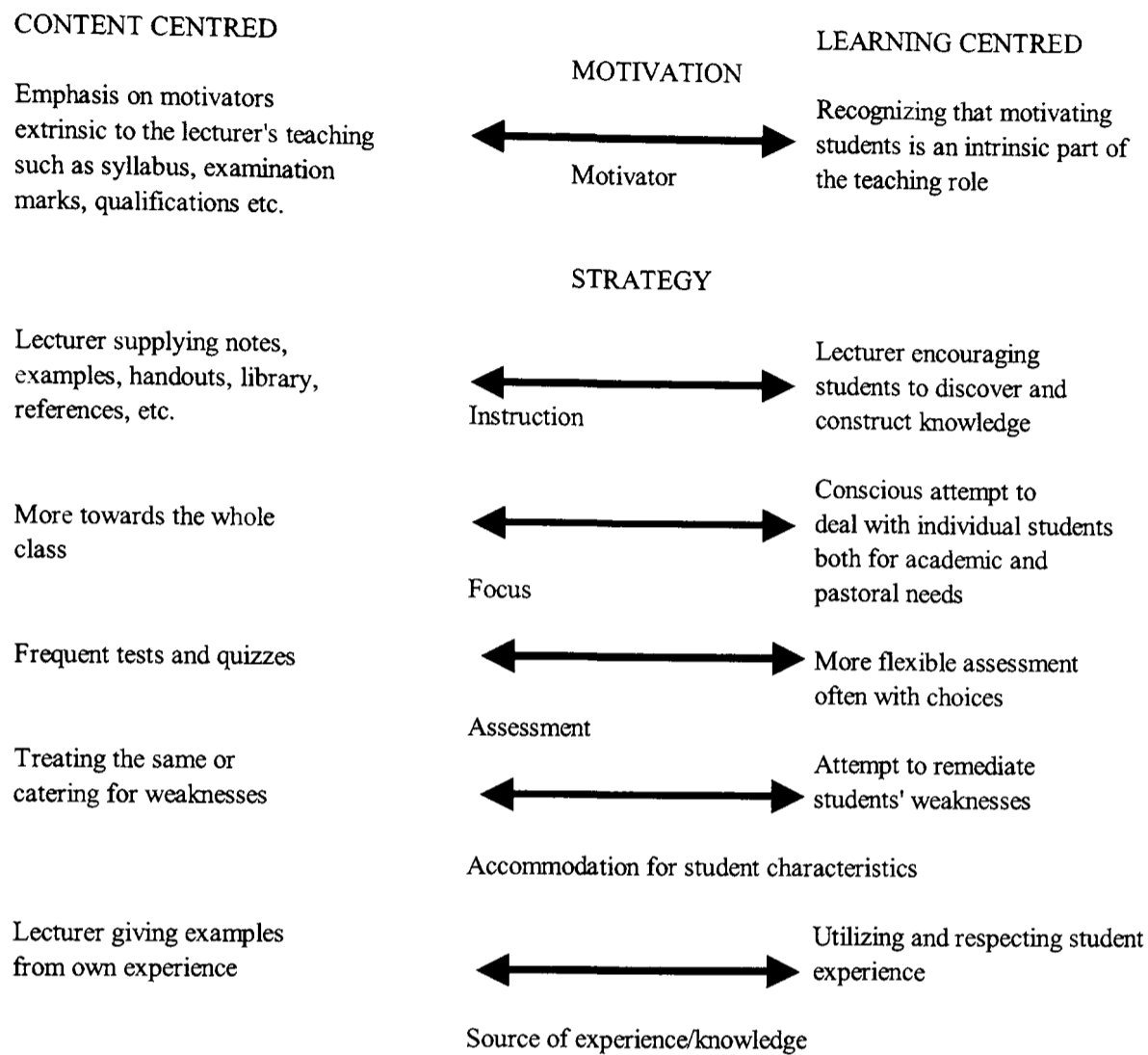


**Figure 3-3 – This view of student learning contrasts with that shown in Figures 3-1 and 3-2. Here depth of learning is orthogonal to type of learning (Novak and Gowin, 1984)**

Kember and Kwan (2000, Figure 3-4), provided a good summary of the contrast between the content and student centred styles of learning along two dimensions, strategy and motivation. The strategy dimension also breaks down into instruction, focus, assessment, accommodation for student characteristics, and source of experience and knowledge. However, this diagram is better seen as a delineation of important areas than as a series of scales. Kember and Kwan noted that ‘*The teaching methods utilised did not seem to be determined by any fundamental beliefs about teaching.....The approaches are portrayed as the opposite poles of a series of continua rather than two discrete categories, as this seems to better represent the data*’ (p 475) so the suggestion of a bipolar approach in Figure 3-4 is not supported by the research.

Samuelowicz and Bain (2001) found that teachers’ views on assessment parallel their views about teaching. Thus, teachers who believed reproducing knowledge was key saw knowledge as atomised information and used feedback to amend their teaching; those who believed transforming conceptions of the discipline/world to be most important saw

knowledge as to be re-organised, transformed and internalised, and set open ended assessments which ‘*challenge students’ existing ideas and understandings*’ (p183).



**Figure 3-4 – A breakdown showing how the different styles of teaching (content centred and learning centred) differ in terms of motivation and strategy (Kember and Kwan, 2000)**

The teacher’s conception of the nature of teaching and learning is likely to influence the way the task is actually carried out. Entwistle (1998) summarised the findings of a number of papers, (Ramsden 1997, Marsh 1987), as to what constitutes a ‘good’ lecture from the student perspective. There are seven main categories: level, pace, structure, clarity, explanation, enthusiasm, and empathy. Of these, the latter three are deemed most likely to support a deep approach to learning. However, these approaches may be subordinate to a general quality of wanting to encourage a self-reflective approach to learning (Andrews, Garrison and Magnusson, 1996).

Hativa and Birenbaum (2000) examined students’ preferences for teaching in relation to the approaches to learning literature. The greatest preference, by some considerable distance, was for the teacher who was clear and interesting, the second preference – described as the *providing instructor* – was the individual supportive of student learning. The other two

types – rated much below the first two – are the *self-regulation promoting*, and *information provider*. Each teaching type was composed of a number of sub-scales, the highest rated of all of these was ‘*presents material in a clear manner*’. At the bottom, the two lowest rated scales and somewhat counter-theoretically, were ‘*promotes active learning in class*’ and ‘*promotes self-regulated learning*’.

Dubin and Taveggia (1968), in an early meta-analysis, compared teaching styles that were instructor centred with those that were student centred. They found that ‘*no particular method of college instruction is measurably to be preferred over another when evaluated by student examination performance*’ (p35), which raises a question mark about the link - if any - between teaching style and examination success.

### **3.4 SUMMARY**

A series of presage factors to learning approach has been identified in the literature. Investigating differences in presage factors between the two groups of students under investigation will provide an important element of this study. Presage factors can be either characteristics pertaining to the individual – termed ‘personological’ by Biggs – or relating to the learning context. Learning context presage factors are largely those concerned with the teacher, the form of assessment, or the course itself.

The next chapter goes on to examine the next of the ‘3-Ps’, the process of learning, in more detail.

# Chapter 4 - The Learning Process

## 4.1 INTRODUCTION

Two fundamental approaches to learning – deep and surface - emerged using phenomenographic experimental techniques. Subsequently a number of psychological instruments were designed to capture the tendency of students to approach their learning in a particular way. This chapter explores the phenomenographic results (section 4.2), describes the most important psychological instruments (section 4.3) and summarises evidence gained by use of the instruments (section 4.4).

## 4.2 PHENOMENOGRAPHIC APPROACHES

Marton (1981) formulated the concept system he called phenomenography to describe the relationship between the student and task that comprises learning. The underlying idea was the phenomenological view that people act according to their interpretation of a situation as opposed to some objective reality. The practical result is that the intention of teaching is perceived as for students to experience a qualitative change in their '*way of seeing, experiencing, understanding, conceptualising something in the real world*' (Marton and Ramsden, 1988). This focus on conceptual change involves not just the student and teacher but the context and content of learning also.

*'Phenomenography is the empirical study of the limited number of qualitatively different ways .. we experience , conceptualize, understand, perceive, apprehend etc. various phenomena in and aspects of the world around us. These different experiences, understandings etc are characterized in terms of categories of description, logically related to each other, and forming hierarchies in relation to given criteria. Such an ordered set of categories of description is called the 'outcome space' of the phenomenon or concepts in question'* (Prosser and Trigwell, 1999a; p57)

Trigwell (2000) described the aim of a phenomenographic approach:

*'to describe the key aspects of the variation of experience of a phenomenon rather than the richness of individual experiences, and that it yields a limited number of internally related hierarchical categories of description of the variation'* (p75)

Although the terms were coined by Craik and Lockhart (1972) in a slightly different context, Marton and Säljö (1976a) were the first to identify ‘*deep learning*’ and ‘*surface learning*’. The former suggested involvement with the course materials at a conceptual level, the latter implied a tendency to skim the material but, more particularly, to memorise key facts and concepts with a view to regurgitating them in an examination session. Marton and Säljö used phenomenographic methods and worked with a small sample of 30 first-year, female, education students. They were able to demonstrate a correlation between deep and surface approaches to learning and high and low levels of understanding.

The deep learners perceived the point of learning as understanding concepts and meaning – the surface learners as to answer possible examination questions:

*‘In ...surface level processing the student directs his attention towards learning the text itself.. he has a ‘reproductive’ concept of learning .. he is.. forced to keep a rote learning strategy. In .. deep level processing .. the student is directed towards the intentional content of the learning material .. directed towards comprehending what the author wants to say’* (Marton and Säljö 1984, p7-8).

Surface processing can be seen as the ‘*storage of the particular representation within which information is presented*’ and deep processing ‘*transforming, recoding and elaborating information*’ (Lindsay 1999, p63).

Under the original formulation deep and surface were perceived to carry a learning style dimension: deep was equivalent to deep and holistic, surface to surface and atomistic.

In a follow up study, based on 40 first-term, female, education students, Marton and Säljö (1976b), were able to demonstrate that the nature of the task demanded had an effect on the approach to learning the student used. The students were divided into two groups and required to answer questions on two passages they had read; the first group was given questions designed to elicit a surface response, the second questions designed to provoke a deeper response. The first group’s responses on reading a third passage reflected a more surface approach; the second group’s a deeper one, though significant intra-group differences were also noted.

The work of Marton and Säljö underpins the present study. By measuring the students’ approaches to learning it should be possible to determine the quality of understanding they

achieve, thus facilitating an understanding of the behaviour of the two groups of students under consideration.

### **4.3 MEASURING APPROACH TO LEARNING - THE PSYCHOLOGICAL INSTRUMENTS**

The process of learning – the tendency of students to adopt a deep or surface approach to their learning – has generally been measured using one or other of a number of specially designed psychological instruments. The two most widely used in the literature have been the Approaches to Study Inventory (ASI) or one of its successors, mostly used in the UK, and the Study Process Questionnaire (SPQ), widely used in Australasia and the southern hemisphere. Although the ASI and SPQ were founded in part on a conception of individual learning style, the cognitive style elements have largely disappeared as the ASI has developed through successive variants though the SPQ has remained unchanged since its inception.

The ASI was developed in the UK, at Lancaster University; it subsequently gave rise to a series of inventories capable of assessing student approaches to learning, culminating in the Approaches and Study Skills Inventory for Students (ASSIST). Developed in the UK and tested on UK students, ASSIST was the logical choice to be used in the present study. The Study Process Questionnaire (SPQ), developed by Biggs in Australia, shares many features with the ASI family. Details of the SPQ's development provide a useful contrast to that of the ASI; more importantly, papers critical of this method of measuring approach have been written about each methodology but the criticisms often apply to both. Section 4.3.1 discusses development of the ASI/ASSIST, section 4.3.2 explains the ASSIST questionnaire in more detail, and section 4.4 discusses development of the SPQ.

#### **4.3.1 DEVELOPMENT OF THE ASI/ASSIST**

Entwistle and Ramsden (1983) attempted a major project to produce an instrument capable of addressing student learning, going beyond simple input/output measures that had hitherto displayed poor correlation with student success. The final product relied on a mixture of previous theory plus a pragmatic approach to develop variables having high explanatory power, which emerged from a factor analysis. In part Entwistle and Ramsden built on Marton and Säljö's (1976a and 1976b) work but they also developed earlier research at Lancaster looking at motivation and study methods, and personality types (Entwistle and Wilson, 1977), and from Pask's (1976) work on learning style. There was a deliberate attempt to make the research both task-based - Pask had used lengthy experimental tasks -

and use interviews, following Marton's technique. Interviews were used for development of questionnaires and also as raw data for qualitative analysis. The project looked at both learning styles and approaches to study and represented the '*largest programme of research into student learning ever carried out in Britain*' (Entwistle and Ramsden, 1983; p4) They took as axiomatic that there is no '*one best combination of characteristics*' but that the environment reacted '*subtly and continuously*' with the students' individual characteristics.

Further details of the ASI's development and that of its successors, the Revised Approaches to Study inventory (Entwistle and Tait, 1996; RASI) and the final inventory in the ASI series, the Approaches and Study Skills Inventory for Students (ASSIST) are provided in Appendix 2.

#### 4.3.2 THE ASSIST INSTRUMENT

Appendix 1 shows the full version of ASSIST used in this study. Section B, the central 52 questions of the questionnaire, is used to determine students' approaches to study and is the only part of the questionnaire of interest here. This section consists of a series of questions aimed at discovering the student's approaches and attitudes to study. Each question asks the student to respond on a five point Likert scale from agree to disagree but the students are encouraged not to use point three, which would indicate neither agreement nor disagreement. Questions such as '*I usually set out to understand for myself the meaning of what we have to learn*' and '*I find I have to concentrate on just memorising a good deal of what I have to learn*' clearly relate to the way students actually learn; those such as '*Some of the ideas I come across on the course I find really gripping*' and '*I often seem to panic if I get behind with my work*' address the more motivational aspects.

Responses are analysed using factor analysis and three factors normally emerge, associated with deep, surface, and strategic approaches to learning. The strategic factor represents a student using a deep or surface approach depending on their view of the one most appropriate in the context of their learning. These factors are orthogonal, meaning that a student may score high (or low) on any or all of the factors. The factor analysis used in this study is described in more detail in section 9.4 of the methodology chapter.

Each main factor emerging from the factor analysis is divided into elements or sub-scales. The deep and surface factors contain four sub-scales and the strategic factor five sub-scales; three of the sub-scales (four for the strategic factor) relate to approach to learning and one relates to motive for learning (Table 4-1). The 52 ASSIST questions are divided into

thirteen groups of four. The questions in these groups are randomly distributed through the questionnaire - each group is associated with and contributes to a single sub-scale. Thus, the first sub-scale, termed 'seeking meaning' and comprising questions numbered 4, 17, 30, and 43, is one of four contributing to the deep factor.

	<b>Approach</b>	<b>Motive</b>
<i>Deep</i>	Seeking Meaning Relating Ideas Use of Evidence	Interest in ideas
<i>Strategic</i>	Organised Study Time Management Monitoring Effectiveness Alertness to Assessment	Achieving
<i>Surface Apathetic</i>	Unrelated Memorising Lack of Purpose Syllabus Boundedness	Fear of failure

**Table 4-1 - The thirteen ASSIST sub-scales split into approach and motive**

To arrive at an approach 'score' for each student, the score for each of the four questions on a sub-scale, from one to five is totalled, The exercise is then repeated for the all the other subscales, so every sub-scale will have a minimum score of four and a maximum of twenty.

The sub-scales contribute independently to the factor analysis but a score for each of the main factors - deep, surface, and strategic - can be computed by averaging the scores on each of the sub-scales associated with that factor. The minimum score for a factor will therefore be four – an average score of four on each sub-scale – and the maximum twenty – an average of twenty on each sub-scale.

### 4.3.3 DEVELOPMENT OF THE SPQ

Production of the second major instrument widely used in the SAL literature – the Biggs Study Process Questionnaire (Biggs, 1987) - paralleled development of the ASI. The SPQ variables derived from three sources:

- Personality theory;
- Information processing theory;
- Study skills.

Biggs (1993) suggested that the main driver was initially information processing theory but it later became modified towards the SAL approach favoured by the ASI and its successors. Biggs tested the first version of the SPQ, which had two dimensions, on 718 students (420 first year, 298 Dip Ed) and, in its second version, on 300 first year students.

In its next version, the factors were divided into affective (which provided a motive for learning) and cognitive (which provided a strategy for learning) so the whole was a ‘*congruent motive-strategy package*’. Each motive/strategy combination defined a different approach to learning (Tables 4-2 and 4-3).

<b>Dimension</b>	<b>Value</b>	<b>Motive</b>	<b>Strategy</b>
Reproducing	Pragmatism	Anxiety	Rote Learning
Internalising	Openness	Academic	Meaning
Organising	Winning	Achievement	Structuring

**Table 4-2 – *The relationship between Dimensions, Values, Motivations, and Study Strategies in the SPQ (Biggs, 1987 p 276; Adapted)***

The final version of the SPQ had six scales, three (deep, surface, and achieving) associated with a motive for learning and three (also deep, surface, and achieving) associated with a strategy for learning. There are 42 questions in total, seven linked to each scale, and, with five possible responses per question, scores on each scale can range from a minimum of seven to a maximum of thirty-five but scores on the motive and strategy scales can also be combined (summed) to give an overall deep, strategic, or achieving score ranging from fourteen to seventy.

Further details of the SPQ's development are provided in Appendix 2.

Study Process		Approach
Motive	Strategy	
To meet minimum requirements; need to achieve balance between working too hard and failing	Reproductive; limit target to bare essentials and reproduce through more learning	Surface (Utilising)
To realise interest and competence in particular academic subjects	Reads widely with previous relevant knowledge	Deep (Internalising)
Competitive; tries to obtain highest grades whether or not the material being studied is interesting	The 'model' student: organises time and working space	Achieving

**Table 4-3 – *The relationship between Motivation, Strategy, and Approach within the SPQ (Biggs, 1979; Adapted)***

#### 4.3.4 COMPARISON OF ASSIST AND SPQ

Table 4-4 shows how the scales and sub-scales within ASSIST compare with those of the SPQ (development of the scales from ASI to ASSIST can be found in Appendix 2). The table shows a close relationship between the two but 'interest in ideas' and 'fear of failure' in ASSIST are translated as deep and surface motivations in the SPQ, which makes an assumption that may not necessarily hold in practice.

<b>ASSIST</b>	<b>SPQ</b>
<i>Deep Approach</i>	<i>Deep Strategy</i>
Seeking Meaning	
Relating Ideas	
Use of Evidence	
<i>Interest in ideas</i>	<i>Deep Motive</i>
<i>Surface Apathetic Approach</i>	<i>Surface Approach</i>
Syllabus Boundedness	
Unrelated Memorising	
Lack of Purpose	
<i>Fear of failure</i>	<i>Surface Motive</i>
<i>Strategic Approach</i>	<i>Achieving Strategy</i>
Organised Study	
Time Management	
Monitoring Effectiveness	
<i>Achieving Motive</i>	<i>Achieving Motive</i>

**Table 4-4 – Comparison of scales and sub-scales of ASSIST and SPQ**

#### **4.4 TESTS OF THE INSTRUMENTS**

Table 4-5 (on page 35) provides a summary of the more important tests of the ASI/RASI/ASSIST and SPQ. Further details of the studies are found in Appendix 2 but two conclusions are immediately evident:

- Evidence of deep and surface approaches to learning have been identified in a wide range of countries, institutions, and subject areas, using samples containing considerable numbers of students. Watkins, 1983; Biggs and Rihn, 1984; Meyer and Parsons, 1989, were among the studies only finding evidence for two factors termed ‘deep’ and ‘surface’ in each case.
- Evidence for factors other than deep and surface is mixed and the labels attached to these factors so varied as to render them questionable for use in research.

Comments from two of the studies are worth quoting:

Duff (1997a) was an attempt to make a psychometric assessment of the reliability and validity properties of the RASI. He interviewed 356 business students over four years of

their degree, 129 of whom - the largest group - were studying accounting, and concluded that there was '*Evidence of moderate to high internal consistency reliability and satisfactory construct validity*' (p529). Duff recommended the instrument as a satisfactory research tool.

Waugh and Addison (1998), tested the validity of a version<sup>7</sup> of the RASI on 346 volunteer first year students at a university in Western Australia. They concluded that the '*psychometric properties of three subscales (deep approach, surface approach and strategic approach) are only moderately satisfactory and the .. other two .. are unsatisfactory*' (p 95).

The next chapter looks at the relationship the studies have found between approach to learning and performance. A critique of SAL, including comments on the use of the instruments, is found in Chapter Six.

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<sup>7</sup> This one had 38 items with only four responses per item (agree to disagree)

Study	Year	Country	Instrument	Size	Sample	Comment
Hattie and Watkins	1981	Aus./Phill.	SPQ	255+173	1st year	Support for six scales
Watkins	1982	Aus.	ASI	540	1ST Yr Mixed	Factors for deep/surface approach; Reproducing broken down into surface/confusion
Biggs	1982	Aus.	SPQ	1016	Mixed	Deep, Surface, Strategic Motives and Strategies
Watkins	1983	Aus.	ASI	292	Seven senior courses	Only two factors
Entwistle and Ramsden	1983	UK	ASI	2208	Mixed	Meaning, Reproducing, Achieving, Styles and Pathologies
Biggs and Rihn	1984	Aus.	SPQ	374 Coll/870 Univ.	Mixed	Only two factors
Clarke	1986	Aus.	ASI	153	Medical students yrs 1/3/5	Three scales confirmed
Meyer and Parsons	1989	SA	ASI	1194	Mixed	Only two factors
Harper and Kember	1989	Aus.	ASI	-	Meta Analysis of 6 studies	Two main factors plus two others given various names 'operation', 'disorganised'
Entwistle and Tait,	1995	UK	RASI	640	Mixed	Deep Approach, Surface Approach, Strategic Approach, Lack of Direction, and Academic Self-Confidence
Sadler-Smith	1996	UK	RASI	245	Business	Three factors
Duff	1997	UK	RASI	356	Business	Confirms validity of RASI
Tait, Entwistle, and McCune	1998	UK	ASSIST	1231	Mixed	Deep, Surface/Apathetic, Strategic
Sadler-Smith and Tsang	1998	UK/HK	RASI	225/183	2nd Yr Business	All scales significant except 'relying on memorising'
Waugh and Addison	1998	Aus.	RASI	346	1st Yr Business	Five approaches to learning
Watkins	1998	10 Countries	SPQ	4359	Metastudy	Generally support for SPQ
Burnett and Dart	2000	6 Countries	SPQ	10500	Metastudy	Generally support for SPQ

Table 4-5 – A list of some of the most important tests of the psychological inventories used to measure student approaches to learning, with a brief summary of the results (Author)

# Chapter 5 – Approach and Performance: the Product

## 5.1 INTRODUCTION

Key to the SAL methodology is that different approaches to learning are associated with qualitatively different outcomes (Biggs 1979, Marton and Säljö 1976a, Trigwell and Prosser 1991) but the nature of that 'outcome' is not entirely clear. Outcome can be seen in terms of understanding of the subject or of success in assessment. Assessment grades are relatively easy to measure but level of understanding is a more complex concept. Biggs and Collis (1982, 1989) developed a framework known as SOLO (Structure of Observed Learning Outcomes) that can be used to classify students' level of understanding.

Table 5-1 (Ramsden 1992, p30 from Ramsden and Entwistle 1981) summarises the results of Entwistle and Ramsden's work over a number of years. It demonstrates the complexity of the links between approach and outcome and indicates that an intention to understand coupled with a deep approach to learning should result in a surface level of understanding; similarly, an intention to reproduce coupled with a surface approach should result in incomplete understanding. But an achieving intention (a strategic approach) could also result in good understanding, whereas an intention to partially understand is likely to lead to incomplete understanding. Thus, the link between intention and outcome is not simple, high grades may result even without an intention to understand.

This chapter explains the SOLO classification system in more detail in section 5.1.1 and then goes on to explore the literature on the empirical evidence relating approach to outcome. Section 5.1.2.1 looks at the literature on the relationship between approach to learning and university assessment grade, and section 5.1.2.2 that of approach and SOLO level. Section 5.1.3, is devoted to a single large project on student achievement carried out by the CNAA (Gibbs, 1992) and the whole is summarised in section 5.2.

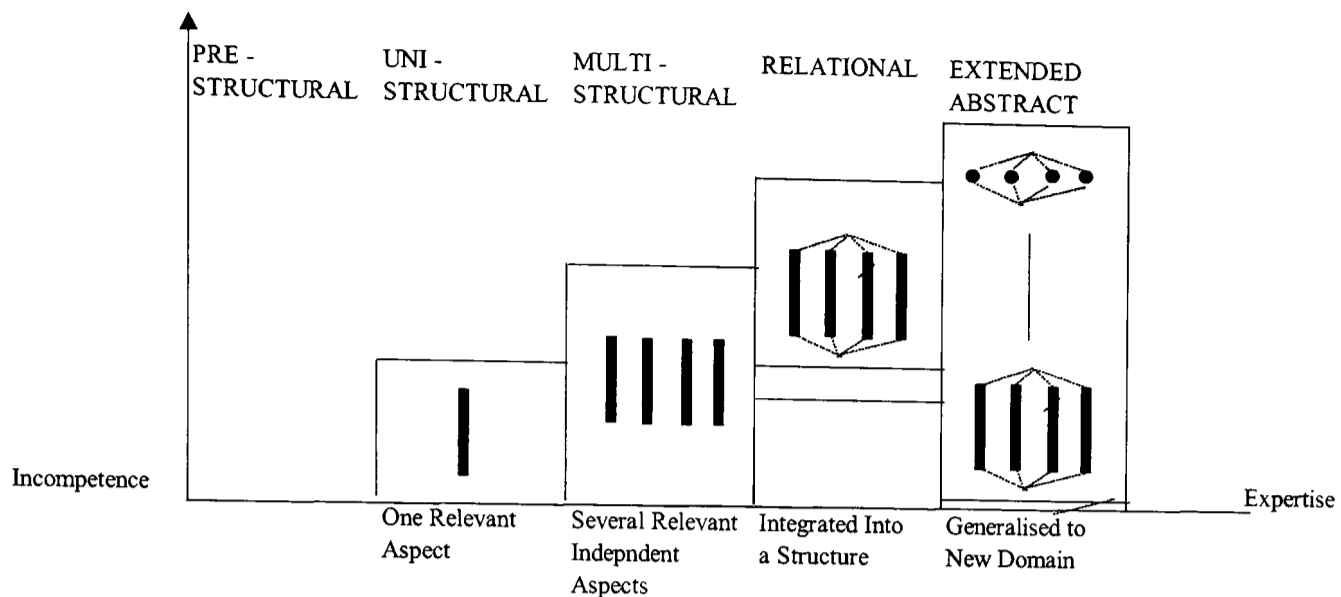
<i>Intention</i>	<i>Approach/Style</i>	<i>Process</i>		<i>Outcome</i>
		<i>Stage 1</i>	<i>Stage 2</i>	
Understanding	Deep Approach/ Versatile	All processes used to develop a full understanding		Deep level of understanding
Partial Understanding	Comprehensive Learning	Building overall description of current area	Reorganising and relating ideas to prior knowledge	Incomplete understanding through globetrotting
	Operation Learning	Detailed attention to evidence and its provenance	Relating evidence to conclusions critically	Incomplete understanding through improvidence
Reproducing	Surface Approach	Memorisation	Over-learning by routine repetition	Surface level of understanding
Achieving	Strategic with organised studying	Any combination of the above processes considered to be necessary in carrying out the perceived task requirements		High grades with or without understanding

**Table 5-1 - Different approaches to learning and styles of learning involve the use of various processes to arrive at differing outcomes (Entwistle, Hanley, and Hounsell 1979, adapted)**

### 5.1.1 THE SOLO MODEL

It was from Säljö's framework, and based broadly on Piaget's developmental psychology, that Biggs and Collis evolved the SOLO framework (Figure 5-1) the instrument most widely used in studies of depth of learning. The student is perceived to progress through five successive stages of learning: Prestructural – preliminary preparation, Unistructural – one aspect picked up serially, Multistructural – two or more aspects picked up or understood serially but not related, Relational – two or more aspects related, the whole has coherent structure and meaning, and Extended Abstract – the whole is generalised to a higher level of abstraction.

Hattie and Purdie (1998) contended that SOLO is superior to the conventionally used Bloom's taxonomy because of its derivation from student learning theory as opposed to a teacher-imposed view of learning quality.



**Figure 5-1 – The SOLO Model: quality of learning, from incompetence to expertise, is reflected by complexity of student understanding within and between schemas in one or more domains of knowledge. Pre-structural implies no understanding and extended abstract a level of complexity extending to several knowledge domains (Biggs, 1991)**

### 5.1.2 APPROACH AND PERFORMANCE

The SOLO taxonomy regards the highest level of outcome as being expertise in a subject and the implication of the literature is that the highest-level outcome will be associated with a change in the student's conceptual view of the subject. Whether outcome, defined in the sense of passing (or failing) a piece of assessed work, is the equivalent of achieving a high or low level of understanding using the SOLO framework is a matter for empirical study - the studies described below suggest that the two are far from equivalent.

#### 5.1.2.1 PERFORMANCE IN UNIVERSITY ASSESSMENT-EXAMINATION AND COURSEWORK GRADES

Svennson (1977) was the first to relate performance in examinations and approach. He took the 30 students already interviewed and classified by Marton *et al.* (1976b) and found a high correlation between deep learning and examination success; note the use of interview to establish approach to learning in this case. The success was in a first year examination in education. He also noted that students taking a deeper approach spent more time learning, considering this was natural as deep learning would be more interesting. Svennson identified holistic learners - linking Pask's work on learning style to the future classification of deep and surface approaches to learning - as building a frame then rebuilding the frame when certain aspects of a problem didn't fit. Of the eleven 'holistic' (=deep) learners, ten

passed all their first-year examinations. By contrast, only seven of the nineteen ‘atomist’ (=surface) learners did so.

As part of Entwistle and Ramsden’s (1983) work on the ASI, they carried out in-depth, semi-structured interviews on 57 Lancaster University students spread across a number of subject areas. They found that background knowledge tended to be related to the level of approach in science and technology; and to the level of interest in social sciences and arts. In the present study accounting – being largely a mathematically based subject – would be identified as a science. Table 5-2 provides a breakdown of the degree classification of 42 of these students and shows a strong correlation between approach and degree classification. Ramsden and Entwistle used both interviews and questionnaires to determine the approach of their students.

	<b>Deep</b>	<b>Surface</b>	<b>Total</b>
<i>Good degree</i>	16	5	21
<i>Other degree</i>	10	11	21
<i>Total</i>	26	16	

**Table 5-2 - Entwistle and Ramsden correlated the degree classifications of 42 students with their approach to learning (1983)**

Several of the papers listed in Table 4-5 (page 35) attempted to relate academic performance with approach to learning. The results of these papers and others specifically examining the relationship between approach and achievement are listed in Table 5-3.

The results from these studies vary considerably. Most reported some correlation between approach to learning and performance as measured by success in university assessment. In some cases correlation was between achievement and the deep scale (Sadler-Smith, 1996), in others only the surface approach correlated (negatively - Watkins, 1983; Clarke, 1986; Byrne, Flood and Willis, 2002) but for the most part the correlation was distributed unpredictably amongst the various sub-scales (Entwistle and Ramsden, 1983; Duckwall, Arnold, and Hayes, 1991).

Several of the studies attempted correlation with differing forms of assessment. For example Sadler-Smith (1996) looked at overall assessment results and also three pieces of coursework; finding a positive correlation between overall assessment and a deep

<b>Study</b>	<b>Year</b>	<b>Country</b>	<b>Instrument</b>	<b>Comment</b>
Watkins	1982	Aus.	ASI	Only surface/confusion consistently relates to performance
Watkins	1983	Aus.	ASI	Most correlation in surface area
Entwistle and Ramsden	1983	UK	ASI	Low correlation and significance
Clarke	1986	Aus.	ASI	Surface (particularly affective sub-scales) not deep; not 'highly predictive of academic success'
Duckwall, Arnold, and Hayes	1991	US	ASI	Some relation with some sub-scales
Sadler-Smith	1996	UK	RASI	Not particularly successful as predictors of academic performance'; deep approach low correlation but significant
Sadler-Smith and Tsang	1998	UK/HK	RASI	Some UK correlation with performance, none in HK
Tait, Entwistle, and McCune	1998	UK	ASSIST	Surface and strategic only
Watkins	2001	Many Countries	Meta-Study	Surface -16.4%, Deep 22.8%, Strategic 24.1%
Byrne, Flood and Willis	2002	UK	ASSIST	No relation deep; positive strategic; negative surface
English, Lockett and Mladenovic	2004	Aus.	SPQ	Surface -9.6%, Deep not significant

**Table 5-3 - Selection of Studies Relating Approach to Learning and Performance (Author)**

approach but almost none elsewhere. The results from different countries were also mixed, Sadler-Smith and Tsang (1998) compared results for students from the UK and Hong Kong. Some correlation between approach and academic achievement – both positive with a deep approach and negative with a surface approach - was found in the UK but none at all in Hong Kong.

The results from one of these papers - Watkins (1998, Table 5-4) – is provided as an example, being a large meta-study of nine other papers, covering several countries and more than 4,000 students. The Table shows an overall correlation of 17% between students having a deep approach to learning and formal assessment; -16% for those having a surface approach; and 20% for the achieving approach. Eight of the nine studies were significant for the deep approach, six of the nine for the surface approach, and seven of the nine for the achieving approach. Thus the studies showed a generally significant but not especially high, relationship between approach and performance in assessment.

<b>Country</b>	<b>Subjects</b>	<b>Surface Approach</b>	<b>Deep Approach</b>	<b>Achieving Approach</b>
Australia	815	-0.18*	0.22*	0.23*
Australia	1550	-0.10*	0.22*	0.21*
Australia	269	-0.18*	0.06	0.10
Australia	249	-0.25*	0.24*	0.18*
Hong Kong	162	-0.23*	0.20*	0.23*
Nepal	342	-0.10*	0.06	0.06
United Arab Emirates	246	-0.27*	0.25*	0.36*
USA	524	-0.11*	0.16*	0.14*
USA	202	0.02	0.11	0.27*
Overall mean correlations	4359	-0.16	0.17	0.2

**Table 5-4 – Watkins carried out a meta-analysis of the relationship between approach to learning and performance in assessment covering 4,359 students in five countries (1998). The correlations were generally significant though not especially high.**

Watkins (2001) also carried out a meta-analysis based on data from nearly 30,000 students in fifteen countries, though not all these students were in higher education. In the latter paper, taking only the statistically significant results reported from university students, i.e. excluding school students, a weighted average of results from 9,268 students gave correlations with performance of: surface -16%, deep 23%, and achieving 24%; and for

21,473 students including those from secondary schools<sup>8</sup>: -12%, deep 15%, achieving 19%. In both these studies, the correlations are not high but are consistently significant.

Two studies Byrne, Flood and Willis (2002) and Tait, Entwistle, and McCune (1998) compared approach with performance using the ASSIST questionnaire. Both found surface and strategic scales to correlate with performance, the former negatively and the latter positively, but neither found a relationship between the deep scale and performance.

#### 5.1.2.2 THE SOLO STUDIES

The depth to which students generally acquire understanding has been of much concern. Dahlgren (1997) concluded that '*Conceptual changes are undoubtedly ... difficult to trace. Such changes do take place but are probably relatively rare, fragile, and context dependent occurrences*' (p36). Prosser and Miller (1989) declared that '*many [students] are unable to show that they have understood what they have learned*' (p30).

Evidence for a lack of deep learning comes from a number of studies:

The earliest was Dahlgren (1978); working with two groups of fifteen first year economics students. He provided no quantitative information, but, in terms of student understanding, referred to a '*dismal picture*' (p35) and suggested that '*in order to cope with overwhelming curricula, the students probably have to abandon their ambitions to understand what they read about and instead direct efforts to passing the examinations*' (p11). Dahlgren (1988) tested economics students on their understanding of economic principles and subsequently assessed the depth of their knowledge. Only one of thirty-three students assessed achieved the highest category of learning, a further seven fitted into the next group down, though Dahlgren did demonstrate that persistence of understanding (over two years) was correlated with depth of learning.

A number of papers have demonstrated a hierarchical outcome space of learning: Renstrom, Andersson, and Marton (1990), with high school physics students identified six categories, Crawford, Gordon, Nicholas, and Prosser (1993, 1994) identified five categories of responses about mathematics, split between a fragmented and cohesive conception, but the largest and most comprehensive studies have followed the SOLO taxonomy described in section 5.1.1 above.

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<sup>8</sup> Tested with the LPQ, the school equivalent of the SPQ

The largest of the SOLO studies was Boulton-Lewis, 1994. She administered the SPQ to 869 students studying for twenty different subjects and tested the SOLO level achieved. The students had to produce written answers to a series of questions. The answers were checked by two independent researchers and Boulton-Lewis herself, to assess the SOLO level of understanding displayed, with a final checker available in case of disagreement. The students were studying at five different levels from first year to Masters. Table 5-5 shows the results and Table 5-6 correlates the approach to learning of the students with the depth of study achieved. The tables indicate that few students achieve a better than multistructural understanding of their subject; only the three SPQ scales shown (out of the usual six – three motivation and three strategy) had a significant correlation with SOLO category, deeper approach being associated with higher achievement level.

	Number	%
<i>Prestructural</i>	8	1%
<i>Unistructural</i>	135	16%
<i>Multistructural</i>	645	74%
<i>Relational</i>	80	9%
<i>Extended Abstract</i>	1	0%
	<b>869</b>	<b>100%</b>

**Table 5-5 - The quality of learning as measured by the SOLO classification for 869 students taking different subjects and studying at several levels (Boulton-Lewis, 1994)**

	Unistructural	Multistructural	Relational
<i>Surface Motivation</i>	10.7	10.0	9.8
<i>Deep Motivation</i>	12.7	13.2	14.0
<i>Deep Strategy</i>	14.9	15.2	15.9

**Table 5-6 – Correlations showing the relationship between approach to learning as measured by the SPQ and SOLO level achieved for the students from Table 5-5 (Boulton-Lewis, 1994)**

Other researchers found a similar pattern of results to Boulton-Lewis. Trigwell and Prosser (1991, Prosser and Trigwell, 1991) working with 122 first-year nursing students, arrived at a similarly distributed SOLO classification. Like Boulton-Lewis, they found a positive relationship between a deep approach to learning and the higher level SOLO outcomes, there was no correlation with quantitative outcomes, i.e. examination marks; unlike Boulton-Lewis, surface learning was not related to either type of outcome.

Van Rossum and Schenk (1984) found that 27 out of 34 students with a deep approach achieved a relational or extended abstract outcome; no student with a surface approach (35 students) achieved higher than multistructural. Other studies with similar findings include: Hazel and Prosser (1994, Biology), Prosser (1994, Physics), Crawford, Gordon, Nicholas, and Prosser, (1998, Mathematics) and Booth (1992, Computer Science)

### 5.1.3 THE COUNCIL FOR NATIONAL ACADEMIC AWARDS (CNAAC) STUDY

By far the largest test of the relationship between depth and approach to date was a major cross-institution study by the CNAAC (Gibbs, 1992) covering forty disciplines and involving 2000 students. It aimed at improving student learning by using a variety of interventions in course design, with the intention of deepening students' approach to learning. A version of the ASI<sup>9</sup> was used to gain evidence of depth and the SOLO taxonomy to analyse quality of learning outcomes, supported by interviews and records of assessment results.

The ASI version used in the studies comprised just the 18 items concerned with the different orientations to studying suggested by Gibbs, Habeshaw and Habeshaw (1988). This, as well as other shortened versions of the ASI, has been criticised as inadequate because its subscales lack sufficient internal consistency (Watkins, 1984). There is also evidence that they measure fairly specific aspects of study behaviour rather than more global study orientations (Richardson, 1992).

The ten case studies reported on by Gibbs all employed different interventions and the quality and nature of reporting the outcomes make it difficult to draw overall conclusions. Over the ten cases, only about 150 students were involved in projects where a statistically significant change in approach to learning was reported and not all of these reported consequent changes in grades or SOLO classifications. However other Gibbs' studies did report such changes without quantifying the effect and most of the studies reported positive qualitative changes in the students' views about their learning, though the methodology used to derive these conclusions is likely to be less robust than that normally employed in phenomenographic studies, which tend to have two or more independent researchers drawing conclusions about the SOLO level achieved.

Two important factors emerged to cloud the results:

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<sup>9</sup> The ASI scales were reproducing, achieving and meaning; in the discussion that follows we retain the synonyms surface, strategic, and deep, as did several of the case study facilitators.

A number of the studies commented that examination marks remained unchanged by the intervention, even though students' attitudes were changed positively (studies at Glasgow and Newcastle); as Vermunt (2005) commented '*It is important to make a difference between learning results and exam achievements in this regard. Too often the latter only reflect a small portion of the former*' (p 209).

For example in the Newcastle case, dealing with mature students, '*Students' assessment results did not show the .. course to have led to significantly better marks than on other courses ...the qualitative evidence presented a different picture*' (p 160). Vermunt also commented '*The use of critical learning activities is far less rewarded in exam performance. This finding is consistent with statements of some students in earlier qualitative research, who stated that, according to their experience, critical processing did not contribute to better exam performance, and who therefore stopped using this strategy in their studies*'. (op.cit. p231).

Other studies reported that changes in attitude were not sufficient to remedy an already inculcated surface approach, or that the approach reverted to surface when confronted with a conventional assessment regime (studies at Birmingham and Napier).

Gibbs also reported, though without producing detailed statistics, that '*students who take a surface approach .. gain lower marks and poorer degree results and [are] more likely to fail ..the range and diversity of these studies leaves no doubt that a surface approach has a disastrous impact on the quality of learning outcomes*' (p4).

Gibbs overall conclusions were that, '*despite these innovations being very positively evaluated by students, their impact on students' approach to studying ...was limited to a reduction in the extent to which they took a surface approach*' (p34) and that '*In these case studies a surface approach was pervasive*' (p162)

Given the reservations about methodology, despite this being a very large study, its contribution to the literature remains limited.

## **5.2 SUMMARY**

The evidence above indicates that although some links have been demonstrated in the literature between both approach as measured by the instruments and assessment and

between approach as measured and SOLO level, those links are neither consistent nor strong. The small number of early studies, which used interviews to assess approach, generally achieved a closer link with academic achievement than the later ones which utilised one of the psychological instruments. The link between SOLO level achieved and performance measured using conventional assessment methods has not been widely studied but the evidence is of a very limited relationship.

The next chapter discusses the evidence for Student Approaches to Learning and criticisms made of the methodology.

# Chapter 6 - Discussion and Critique of the Approaches Literature

## 6.1 INTRODUCTION

This chapter deals with the evidence on the approaches literature and comments on some of the criticisms that have been made of it. Section 6.2 discusses – echoing the learning styles literature – whether approach to learning is likely to be a trait of the student and section 6.3 a number of critiques that have been raised about the methodology. Section 6.4, concludes by listing a number of the problems that remain unanswered regarding the use of SAL for studying student learning.

## 6.2 APPROACHES TO LEARNING IN CONTEXT – APPROACHES AND THE STUDENT

Although Student Approaches to Learning has rejected the notion of fixed learning styles, some echoes of the idea of a link between learning style, personality, and approach still remain. The extent to which SAL is to be seen as a continuing development of understanding about learning, building upon earlier work by the learning style theorists, is important. The various psychological instruments are more likely to possess explanatory power if they form a continuing development in the research literature than if they represent a completely new development.

Biggs initially believed learning styles were stable '*students do have a predilection for a deep or surface approach*' (Biggs and Rihn, 1984; p282) but later '*disavowed this cognitivist perspective*' (Biggs, 1993; p41) and argued that approaches to learning are contextually situated. The significance of this belief is that teachers are no longer able to hide behind the multiplicity of styles to argue that any style may at least be relevant to a few students – under the approaches to learning view teaching style is important in informing the students' approach.

Most researchers have been careful to distinguish the approach (deep and surface) from the student's preferred learning style, though to the extent that an intrinsic motivation may lead to a deep learning style and also be related to personality characteristics, the link is not totally lost. Initially at least, the SPQ relied on tying personality type with deep and surface

learners. Its two original dimensions were personality based: introverted students being seen as divergent, non-dogmatic thinkers, who used meaningful learning strategies, and avoided rote learning; and extraverted students the reverse. Biggs saw these scales as foreshadowing deep and surface learners, so it was possible to speak of deep and surface learners as well as the complementary approaches

Schmeck (1983) asserted that *'a student is not deep or shallow; the student's approach to reading within a given context is classified as such'* but clarified the position by noting that *'each of the orientations predisposes the student to adopt a certain approach to studying. The student seeking meaning tends to adopt a deep level approach'* (p238) and Kember and Gow (1989) noted that *'the terms deep and surface were used to refer both to students' general predispositions to learn in different ways and to different strategies they adopted in specific learning tasks'* (Richardson, 2000; p 74); Haggis (2003) suggested, *'[the term] "deep approaches to learning" becomes "deep learning" and, ultimately, "deep learners"'* (p91)

Richardson (1997) used a version of the ASI, gaining responses from ninety first-year social science students. He identified two clusters of students who had either a reproducing or a meaning orientation. In his sample, women, and younger students tended to have a surface orientation, so the link was with presage factors rather than personality.

Entwistle (2001, Table 6-1) demonstrated how approach and SOLO category can be seen as a development from Pask's work on serial and holistic learners. The active styles relate approximately to Pask's comprehension or holistic learning and the passive styles to operation or serial learning. Entwistle suggested that learning is likely to be a cyclical process involving Pask's holist and serialist ideas, so deep learning might involve *'building an overall description of the topic'* followed by *'connections being made with prior knowledge and between evidence and conclusions'* (p599); the inference being that holist and serialist approaches alternate in a manner reminiscent of Kolb's learning cycle involving perceiving and reflecting.

Approach	Level of Understanding	SOLO Category
Deep active	Explains the author's conclusion and examines how it was justified	Extended abstract
Deep passive	Summarises the main argument accurately, but without considering evidence	Relational
Surface active	Describes the main points made without integrating them into an argument	Multistructural
Surface passive	Mentions a few isolated points or examples	Unistructural Prestructural

**Table 6-1– The relationship between learning style and quality of learning as measured by the Structure of Learning Outcomes (SOLO) classification (Entwistle 2001, p 598, Adapted)**

Entwistle (1990) also suggested the tendency to adopt a particular approach is *'perhaps reflecting cerebral dominance of left (serialist) or right (holist) hemispheres of the brain, combined with firmly established personality characteristics of the individual. Strong stylistic preferences may be rather difficult to modify, implying that choice in both materials and methods of learning is important for allowing students to learn effectively.'* (p675).

### 6.3 CRITIQUE OF THE APPROACHES LITERATURE

Criticisms of the SAL literature tend to revolve around two issues, a positive - whether the approaches to be measured actually exist and the ability of the instruments to measure them - and a normative - whether what is measured is useful in improving the quality of learning.

#### 6.3.1 INTERPRETATION OF THE FACTORS

Interpretation of the factors emerging from the psychological instruments is a matter demanding a degree of judgement. For example, in an analysis using the RASI, Sadler-Smith (1996) derived a five factor solution, one factor - the surface approach - being very similar to the ASSIST surface/apathetic one and split into four sub-scales. However, Tait and Entwistle (1996), using the same questionnaire, derived a three factor solution, one factor being a combination of the surface approach and a separate sub-scale termed academic self-confidence, which emerged as the fifth factor in Sadler-Smith's factor analysis.

The factors derived have no inherent meaning. The names are simply appropriate labels. A student described as having a surface approach to learning is one who has scored highly

(answered ‘strongly agree’) on the questions linked to the four sub-scales comprising that factor.

### 6.3.1.1 COMPARISON OF THE INSTRUMENTS

Wilson, Smart, and Watson, (1996) compared results from the SPQ and ASI given to two samples of first year psychology students, the first with 162 students and the second, 72. The questionnaires were administered in class and returned later. The first of the two groups represented 98% of the cohort and the second 61%. Table 6-2 shows Wilson *et al.*’s correlations between scores on the scales of the two instruments. The three scales along the side of the table reflect three of the main factors emerging from the ASI factor analysis; those along the top reflect approach to learning factors from the SPQ that have generally been assumed in the literature to be equivalent.

<i>Sample</i>	<i>SPQ Deep</i>		<i>Surface</i>		<i>Achieving</i>	
	1	2	1	2	1	2
<i>ASI</i>						
<i>Meaning</i>	0.45**	0.61**	-0.23	-0.49**	0.37	0.18
<i>Reproducing</i>	-0.12	-0.037**	0.44**	0.62**	-0.08	0.04
<i>Achieving</i>	0.31	0.14	0.00	0.18	0.46**	0.46**

**Table 6-2 – Correlations for two student groups - 1 and 2 - between scores from the Approaches to Study Inventory (ASI) and Study Process Questionnaire (SPQ) showing significant, but only moderate, correlations between the two sets of scales (Wilson *et al.*, 1996)<sup>10</sup>**

Although the results are generally in the expected direction, the correlations are not especially high, an indication that the meaning/reproducing/achieving ASI scales do not have identical meanings to the deep/surface/achieving ones of the SPQ although the SAL studies have generally assumed this to be the case.

### 6.3.1.2 SUPPORT FOR THE FACTORS

Richardson (1994a) offered a general critique of the literature. He pointed out that a lot of the studies have failed to find the same factors as Biggs and Ramsden and Entwistle. Although the research generally supported surface and deep orientations to learning, evidence for other approaches has been less widely forthcoming. Biggs and Rihn (1984), in their study of more than two thousand Australian students, found only two factors, broadly corresponding to surface and deep learning.

<sup>10</sup> Throughout this dissertation, \* is taken as equivalent to significance at the 5% and \*\* at the 1% level.

Richardson (1994b) commented, '*None of these established questionnaires appears to be wholly satisfactory for measuring students' approaches to learning in higher education. It is reasonable.. to conclude ..evidence .. for two fundamental approaches...an orientation towards comprehending the meaning of the materials to be learned; and .. an orientation towards merely being able to reproduce those materials for the purpose of academic assessment*' (p510).

And, in a later verdict, '*the SPQ simply measures a generalized surface approach and a generalized deep approach...studies...have also cast doubt on the integrity of the subscales concerned with a surface approach. As a result the SPQ cannot be recommended as a research instrument*' (Richardson, 2000; p85).

Harper and Kember (1989), in a meta-analysis of studies on the ASI, commented that '*the achieving orientation...[contains] ..strategic approach, disorganised study methods, negative attitudes to study and achievement motivation. The results .. show no evidence of a factor with this composition*' (p72) though they did find consistent support for a meaning (deep) and reproducing (surface) orientation. Harper and Kember suggested the factor labelled '*operation learning*' (Watkins, 1982a) and '*disorganised and dilatory*' (Ramsden and Entwistle, 1981) be termed '*narrow*' and that a fourth factor '*goal orientation*' existed containing extrinsic and achievement orientation.

Kember and Gow (1990, 1991), investigating students in Hong Kong, found factors that related well to deep and achieving learning but not to strategic or surface learning. Chinese learners consider both memorisation and understanding to be necessary for learning, the so-called '*Chinese Learner*' syndrome' (Cooper, 2004; Marton, Wen, and Wong, 2005); Kember and Gow's students '*tried to understand each segment of information before committing it to memory*' (Kember *et al.* 1990, p356) and so were different in their approach to learning from their Western counterparts, memorising and understanding being much more closely interwoven in the Confucian tradition than is typical of western students (Marton, Dall-Alba, and Tse 1992, 1996).

Thus there is a distinction to be drawn between memorising in a routine manner – a surface approach - and deep memorising. In part this distinction relates back to Table 5-1, where memorisation can be part of either a reproducing intention or an understanding one. Marton *et al.* found that deep memorising could be preceded by understanding or be simultaneous with it, they also claimed that this was unlikely to be limited to Chinese students but was

true of students more generally. This idea is reflected by Entwistle (2001), who commented that '*some students concentrated more on facts and details in developing a deep understanding, whereas others were more concerned with personal meaning*' (p 598). So although learning facts - operation learning - was initially seen to be rooted in a desire to reproduce, it later became clear that, particularly for science students, which term would include the students in the present study, this kind of learning is essential to understanding (Entwistle and Ramsden, 1983).

However, some researchers (Haggis, 2003; Coffield, Moseley, Hall, and Ecclestone, 2004) take the problem of Chinese students, and similar cultural problems found by Richardson (2000) with Nepalese students, to be a reflection of deeper paradoxes and contradictions.

#### 6.3.1.3 FAILING STUDENTS

Entwistle, Meyer, and Tait (1991), based on approach to learning scores derived from the ASI given in class to 123 first year engineering students and their subsequent examination results, found that the deep/surface/strategic analysis breaks down when applied to failing students; they found clusters of academically weak students who did not show the normal relationship between approach and preferred teaching style. The attitude to learning of these students became incoherent in terms of the approaches identified by the model, in fact the relationship tended towards randomness. Although the sample size was too small for factor analysis, Meyer was able to confirm the conclusion using unfolding analysis (Entwistle *et al.*, 2000).

#### 6.3.1.4 METHODOLOGICAL PROBLEMS

A number of methodological issues have been raised in the literature. Meyer (1998) discussed some of the methodological problems inherent in assessing learning performance. There are significant inter and intra individual differences between learners (for example gender) that may be not reflected by group scores in factor analysis, '*it is of limited value to conceptually compress.. multivariate complexity into neat decontextualised dimensions of variations of.. 'deep', 'surface' or 'strategic' forms of learning behaviour*'(p62). Thus, an approach score averaged across a group may hide differences due to factors such as gender, which have two possible values, or age, where a correlation with age may be hidden in the averaging.

Mitchell (2000) commented on the problems of adding scores ranging from 'strongly agree' to 'strongly disagree'. Originally deep and surface learning were seen as different forms of understanding or along a bipolar scale (Marton, 1976) whereas the instruments assume

orthogonality. Richardson (1997) commented that this creates a tendency to concentrate on aggregate responses not those of individuals, in that averaging scores masks the possibility of identifying clusters of responses at either end of the scales. The use of averages hides the possibility of widely dispersed individual approaches.

#### 6.3.1.5 A MORE GENERALISED CRITIQUE

Haggis (2003) presented a more generalised critique of the assumptions of the SAL model. Part of her critique is methodological – the various instruments used to detect surface or deep learning do not do so directly but only students' responses to questions, which may be quite different (see 6.3.1.4 above). Biggs (1993) pointed out that phenomenographic studies ask students what they are doing whereas the inventories ask what students usually do. However, Richardson (1994b) also criticised the phenomenographic approach – many of the student responses have been gathered casually and may represent social dialogue so far as the student is concerned rather than a considered position. Although the intention is to '*describe the world as people experience it*' (Marton, 1978), in fact, as Richardson (1999) points out, phenomenography records the world as people describe it.

Haggis's second criticism relates to what precisely is indicated by the term 'meaning'; an individual concept, which may be subject specific, yet is being used in this context to measure student personal development. Understanding suffers from the same problems as meaning – it also may be subject specific. Both meaning and understanding may have different meanings in the sciences from the humanities and social sciences – thus any results may not be generalisable outside the context in which they are measured.

However, the main thrust of Haggis's critique, and one particularly relevant for this study, is about the real meaning of the whole approach. Despite a tendency throughout the literature for deep learning to be preferred within education, there is little evidence that it produces superior results in terms of performance in assessment and the preference for such an approach lies with academics:

*'If one of the aims of a University education is a high-quality learning outcome, the research on student learning consistently confirms that to achieve that aim, surface approaches to learning should be discouraged and deep approaches to learning encouraged. Most university teachers are intuitively aware of this position'* (Prosser and Trigwell 1999a, p97).

and

*the deep approach coincides with one of the main aims espoused by most academic staff*  
(Entwistle, 2001; p598)

Richardson (1994a) noted the fact that the deep approach had been found in many cross-cultural studies and suggested this was indicative of a widely shared belief amongst academics that the goal of academic institutions is to encourage '*the promotion of independent, critical thinking*' (p463). Important for the present study is a belief in the importance of a deep approach to learning within the accounting profession, '*In terms of competencies needed to become a successful professional accountant, fostering a deep approach is critical*' (Sharma 1997).

Haggis suggested three assumptions underlying this support for the deep approach by academics: that student aims are the same as those of the academics; that students are able to make sense of the institution's aims; and that students enter universities equipped to deal with the quality of learning expected of them. Haggis is critical of these assumptions and believes that in a situation where student entry to the university sector is much expanded the model is '*based upon a set of elite values, attitudes and epistemologies that make more sense to higher education's gatekeepers than they do to many of its students*' (p102). She concluded that our teaching might be better focused on equipping students with the means whereby they can speak the language and understand the concepts of academia in preference to a contextualised approach to learning. Haggis' criticisms are particularly relevant for the present study – part-time students are not socialised into the ways of higher education and the extent to which they are committed to deep learning is unclear.

Although the deep approach can be logically linked to institutional goals, no converse assumptions can be made about the surface approach, which arises independently of the deep. Most academics believe that it is caused by either ability or motivation problems, though it may be more likely to be a result of an overloaded curriculum or inappropriate assessment (Richardson 1994b, Murray and MacDonald 1997) so there is likely to be more variability on this dimension.

Marshall and Case (2005) provided a response to Haggis. Haggis had noted that deep approaches to learning become synonymous with deep learning, Marshall *et al.* commented that they '*ultimately metamorphose into "deep learners"*' (p258) but make the point that the approach is deep, not the learners. However, they accept the point that the inventories used are not context specific. They challenge the Haggis idea that students do not need to seek deep learning but assert that '*it is .. crucial that higher education be oriented to these aims*' (p 262) though without supporting the assertion. They agree there are problems with

approaches theory but argue the problem arises from the way it is used. The main thrust of their argument is that many researchers have used the approaches instruments within a positivist paradigm; whereas in reality Marshall *et al.* suggest they form heuristics to be utilised within a constructivist/interpretivist perspective. This last comment contrasts with Biggs and Rihn (1984) '*the concepts of deep and surface approach to learning appear to be useful ..both diagnostically and for defining outcomes*' (p292).

#### 6.4 CONCLUSIONS

As a methodology, the learning style paradigm compares unfavourably with that of SAL. The latter's flexibility is attractive and the specific criticisms made of the instruments used to detect learning style weaken the case for their use. However, SAL is by no means perfect. In addition to the criticisms discussed above, there is also the mixed evidence on reliability for some of the instruments. However, a number of issues remain unresolved in the use of this instrument and SAL more generally:

- The scales have developed though a mixture of theory and pragmatism; it is now unclear precisely what they measure. The weak correlation between ASI and SPQ suggests that the deep and surface scales do not measure exactly the same concepts as emerged from the phenomenographic studies.
- The literature is clear on the existence of at least two approaches to learning - for convenience termed surface and deep - but their precise meaning is open to debate and the evidence for the existence of other approaches mixed.
- It is not clear to what extent the instruments are context specific. The questions may not have equal meaning within arts, sciences and social sciences and, particularly, for vocational students. The surface scale might be measuring a tendency to rote learn but, for some students at least, this is likely to be a necessary precursor to deep learning both in subjects with a highly-organised base of theory demanding good knowledge of routine calculation such as science and accounting and for some traditions of learning such as the Confucian.
- The scales are assumed to represent normally distributed, orthogonal phenomena; perhaps a deep or surface approach, at least in some students, is a bimodal phenomenon, '*Whether surface and deep level processing constitute a continuum, a dichotomy or orthogonal or non-orthogonal dimensions*' and '*the 'degree to which approaches .. are ...relatively stable*' (Watkins, 1983; 57-58).
- Evidence of a link between approach and performance--whether measured by formal assessment or SOLO score - is less than wholly convincing. Of particular note for

this study is the absence of any studies using ASSIST that have found a significant correlation between deep score and academic performance.

- The questions ask students to describe what they do, or usually do. This may be different from what they have done and will do; it can only reflect what they think they do – their actual performance may differ.
- The SAL model gives no prioritisation to its variables. There is no way of knowing how each presage factor affects the student's approach to learning, or the factors' relative magnitude.
- The model is weakest in relating approach to learning and product; the links between approach and product are not well specified. The SOLO framework suggests a hierarchy of learning outcomes but the literature is clear that these outcomes do not correlate well with the results of conventional assessment. The externally set and marked ACCA examinations – with no coursework – may relate less closely to the SOLO framework than the more conventional assessment regime at a typical university. Assessing a student's level within the SOLO framework is necessarily subjective, the assessment itself may have a learning effect, and the difference between SOLO classification and examination grade could be due to the Hawthorne effect (Mayo, 1933).
- Finally, and perhaps most significantly, the nature of factor analysis means that it is possible to derive a set of valid factors – in the sense that they will reliably emerge from a set of questions – but that the factors have no inherent meaning. The factors emerging from ASSIST look like deep and surface learning but without triangulation – relating the factors to product (or even to presage variables) it is impossible to be certain of their true meaning.

The net result of these issues is that two approaches to learning – surface and deep – have been clearly identified as contributing to an understanding of how students learn.

Establishing the approach of individual students is problematic: the instruments designed for this purpose do not measure approach precisely, so a degree of uncertainty surrounds any results found. The relationship between approach to learning and product has not been precisely delineated – however that approach has been measured. SAL is used in this study but the criticisms noted above suggest that care needs to be taken in its use.

The next chapter considers the approaches to learning literature within the context of learning accounting in higher education.

# Chapter 7 - Research on Accounting Students

## 7.1 INTRODUCTION

This chapter deals with the literature on the learning of accounting. In line with the SAL framework, it considers first those presage factors that have been identified as affecting accounting students' learning (section 7.2), then the actual approach to learning itself (section 7.3), and finally, the relationship between approach and product (section 7.4). Section 7.5 summarises and concludes the chapter.

## 7.2 PRESAGE FACTORS

The key to this dissertation lies in identifying the presage factors that the SAL model suggests might be involved in causing the two groups of students under consideration to take different approaches to their learning and therefore to achieve such different results. Within the accounting literature a number of presage factors have been investigated and are discussed below.

### 7.2.1 STUDENT CHARACTERISTICS

#### 7.2.1.1 GENDER, AGE, AND, PRIOR EXPERIENCE

The above three factors have been the ones most frequently studied in relation to accounting students. Three studies are of particular importance since they cover a number of the factors and are therefore introduced first:

Bartlett, Peel, and Pendlebury (1993) is a UK study covering a number of the relevant variables. In a longitudinal correlational analysis, they examined 47 accounting students at the University of Wales in Cardiff in the first, and then the 39 who remained, in the final year of their three-year course. They compared performance with entry qualification, back ground, age, and gender. The average student age was nineteen and 79% of the sample was male.

Duff (2004b) is also UK based and used the RASI to compare approach to learning with a number of the relevant presage factors. He studied 60 first-year Accounting and

Business students at Paisley University, 25 were male and 35 female, and the average age of the sample was 20 years. He found that they clustered into two groups. The first scored strongly on the RASI deep learning scale and had low surface learning scores; the second group were the opposite; 75% of the first group progressed to the second year and only 12% of the second.

Koh and Koh's 1999 study was at Nanyang University in Singapore and looked at the effect of six relevant variables on performance on a three-year accounting degree. Like Bartlett *et al.* they used a correlational analysis and did not test approach to learning. Koh and Koh's students were older than the average undergraduate, having generally completed military service, with an average age of 24 years.

#### 7.2.1.2 GENDER

Bartlett *et al.* (1993), and Duff (2004b) in common with the majority of studies - Canlar and Bristol (1988), Eskew and Faley (1988), Buckless Lipe, and Ravenscroft (1991), Carpenter, Friar, and Lipe (1993), Gist, Goedde, and Ward (1996), Keef and Roush (1997), Byrne, Flood and Willis (1999 and 2002), Gammie, Paver, Gammie and Duncan (2003), and Jones and Gammie (2005) - reported gender as having no systematic impact on performance. Koh and Koh (1999) - found performance of male students to be significantly better than that of females - as did Lipe (1989), Williams (1991), and Duff (1999). Yet other studies: Mutchler, Turner, and Williams (1987), Tyson (1989), found that women performed better.

Three studies have commented on gender and approach: Duff (1999) found women more likely to be surface learners and men more likely to be deep; Byrne *et al.* 1999, 2002 found no differences between the two.

#### 7.2.1.3 AGE

Age has not been much investigated as a variable in the accounting education literature; the three studies mentioned above provide mixed results. Koh and Koh (1999) found older students performed significantly less well than younger ones in each of the three years of their study, though theirs were the oldest students of the three studies; Duff (2004b) found no relationship between age and performance, whilst Bartlett, *et al.* (1993) found that older students performed less well in some examinations (though only significantly so at the 10% level) but this had no significant effect on overall degree performance. Dockweiler and Willis (1984) reported that age on entry played a contributory, but not significant, role in the performance of the more mature students, whilst Jones and Gammie (2005) found no

relation between age and performance. However, this mixed picture suggests that if there is an age effect it is well masked by the presence of other variables.

In terms of age and approach to learning, Duff, 1999 (the only accounting study of age and approach) reported age as being positively related to a preference for deep learning.

#### 7.2.1.4 PRIOR EXPERIENCE

Koh and Koh (1999) and Duff (2004b) investigated first year accounting students and identified prior academic performance as an important indicator of subsequent performance in the first year of their degree. This result is in line with many accounting studies in the United States - Clark and Sweeney (1985), Dockweiler and Willis (1984), Doran, Bouillon, and Smith (1991), Eckel and Johnson (1983), Eskew and Faley (1988), Ingram and Peterson (1987), Ward, Ward, Wilson, and Dick (1993). The result has not generally been confirmed past the first year. Mitchell (1985) and Doran *et al.* (1991) found that the initial impact was not sustained, and even reversed, after the first year. But Bartlett *et al.* (1993) failed to find a similar result, possibly because of the massive expansion in higher education in the UK at the time of the study, but also because there was little variation in the entry qualifications of their students.

Duff (2004b) found that of prior academic achievement, in the form of scores on Scottish Higher examinations, was the strongest factor influencing first-year results and commented: *'it is surprising ... that only limited evidence exists concerning the relation between prior educational experience and students' self-reported study approaches'* (p 414).

Koh and Koh (1999) also found that previous work experience of any type, including national service, was an important contributor to academic success, being significant in all three sets of annual examinations in their study.

A specific issue is in respect of prior academic attainment in mathematics; there is mixed evidence on mathematics background as a variable possibly affecting accounting education. Koh and Koh came out on the positive side as did Eskew and Faley (1988), Collier and McGowan (1989), Gul and Fong (1993), and Ward *et al.* (1993). Bartlett *et al.* found no evidence for mathematics as a factor along with Burdick and Schwartz (1982), and Gist *et al.* (1996). There is some evidence that gender and mathematics background interact – Mutchler *et al.* (1987) – contradicted, by Tyson (1989). Of these studies, none are from England and only Bartlett *et al.* from the UK.

#### 7.2.1.5 OTHER FACTORS

Duff (1999) compared the performance of students entering university at the commencement of the first year of a course with those entering subsequently and Hassall and Joyce (2001) with domicile and study method but neither of these studies identified any relationship between the factors in question and approach to learning or the quality of academic performance.

#### 7.2.1.6 CONCEPTIONS OF LEARNING

Two accounting studies have related students' conceptions of learning and approach to learning. Sharma (1997) found second-year students saw learning as '*an increase in knowledge and acquiring knowledge for future application*' (p142). Lord and Robertson (2006) also found third-year management accounting students to generally have a quantitative view of learning. However, and probably because of the difference in level, more of their students (37% compared with 20% for Sharma) had a qualitative conception of learning. Lord and Robertson also found a clear relationship between the deep approach and students with a qualitative view of learning.

#### 7.2.1.7 MOTIVE FOR LEARNING

Motivation forms a separate factor or set of subscales on most of the psychological inventories described above and in Appendix 2. One phenomenographic study related motive to approach; Lucas (2001) identified four foci of learning for students on an accounting course: the real world of business, learning within higher education, future career, passing the subject. The first three were associated with a deep approach to learning and the last with a surface approach, though the sample was of only ten students.

#### 7.2.1.8 PERSONALITY

Several studies have looked at the personality types of: professional accountants (Schloemer and Schloemer, 1997; Satava, 1996; Kreiser, McKeon, and Post, 1990; Jacoby, 1981; Shackleton, 1980); accounting students, (Ramsay, Hanlon and Smith, 2000; Landry, Rogers, and Harrell, 1996); and accounting academics (Wolk and Nikolai, 1997). Research in this area has consistently found a preponderance of Sensing, Thinking, and Judging (STJ) types, especially the I(ntroverted)STJ, type among both professional and aspiring accountants (Wheeler, 2001).

The evidence for consistency of personality characteristics in accounting students is clear and persuasive; the two groups of students under consideration in the present study are unlikely to have different personality types so personality type has not been considered a relevant presage factor in this study.

### 7.2.1.9 STUDENT CHARACTERISTICS, CONCLUSION

Evidence about these variables is generally inconclusive: most, but not all, studies have found no relationship between gender and either performance in or approach to learning. The mixed picture is also true of age in terms of performance but older students are more likely to have a deeper approach to their studies. There is no evidence of a relationship between prior experience (including prior attainment in mathematics) and approach but this is a possibly important presage factor, as is motivation. These factors will be investigated as a part of the study.

### 7.2.2 CONTEXTUAL FACTORS

Leveson (2004) interviewed twenty-four academics on their conceptions of teaching and their students' learning with findings replicating those of Kember (1997): learning as accumulating facts matched a '*teacher-centred*', transmission style of teaching; learning as personal change a '*student centred*' teaching style, encouraging change.

## 7.3 APPROACH TO LEARNING

Although evidence of deep and surface approaches to learning has been widely reported, both in terms of subjects and geographical areas, there is much less evidence within accounting in general and UK accounting in particular. As Byrne, Flood and Willis (2004) observed '*The small number of studies that have measured accounting students' learning approaches have yielded conflicting results*' (p.451). The studies are listed in Table 7-1 with the mix of results indicated. Table 7-2 gives further details of the methodology employed for those studies that quoted approach to learning scores.

Response rates for all the studies were satisfactory; Eley tested the representativeness of his sample by checking the subsequent results of the respondents and non-respondents, finding the sample under-represented the less academically able. Byrne *et al.* used the same method but found no distortion of the sample. Nevertheless, it is logical to believe that the more able students were likely to volunteer to complete a questionnaire, so supporting an assumption that these, and other results using the ASI/SPQ, are biased towards the more able – and, presumably, deeper approach students.

		Country	Type	Number	Course/ Level	Preferred Approach	Result
Bowen, Masters, and Ramsden	1987	Aus.		638	1st yr	Surface	
Chan, Leung, Gow, and Hu	1989				Acctg.	Surface	
Tan and Choo	1990	Aus.	ILP	89	U/G		Better performance by deeper and elaborative students
Eley	1992	Aus.	SPQ	63	U/G	Surface	
Gow, Kember, and Cooper	1994	HK	SPQ	793	Acctg. U/G	Deep (44.7/43.2)	All students less deep/greater surface as move through course
Sharma	1997	Aus.	ASQ	124	Mixed 2nd yr	None (2.74/2.39)	
Duff	1999	UK	RASI	316	U/G		Older students deeper, more strategic; females more surface
Booth, Lockett, and Mladenovic	1999	Aus.	SPQ	374	Acctg. U/G	Surface (42.2/51.2)	Accountants higher surface/ lower deep than other groups
Byrne, Flood and Willis	1999	Ireland	ASSIST	199	Acctg. Business	Acc 13.1/11.9 Bus 12.8/12.9	Higher surface associated with worse performance
Hassall and Joyce	2001	UK	RASI	547	CIMA	Approx. 30/21	Surface declines over four stages; deep stable
Lucas	2001	UK	Phenom	10	Acctg/Bus		3 deep; 7 surface
Davidson	2002	Can.	SPQ	211	U/G Bus & Acctg.	Surface	No relation surface and performance. Deep better on complex examination questions
Byrne, Flood and Willis	2002	Ireland	ASSIST	95	Yr 1 Mgt Acctg	Deep/Surface (12.75/12.18)	Correlation between all scales and performance
Byrne, Flood and Willis	2004	Ireland US	ASSIST	735	Mixed level Acctg.		Three factor solution identified
Ramburuth and Mladenovic	2004	Aus.	SPQ	966	Yr 1 Acctg.		Academic performance related to SOLO level

**Table 7-1 – Studies of Accounting and Approach to Learning**

<b>Study</b>	<b>Institution</b>	<b>Population</b>	<b>Response Rate</b>	<b>Distribution</b>	<b>Comment</b>
Eley	Monash	152 Acctg 74 Biology 54 Chemistry 40 English	47.50%	In Class	Lower academic levels not proportionally represented in responses
Gow, Kember. and Cooper	Hong Kong Polytechnic	All Departments 250 Acctg	80%	In Class	
Sharma	Griffith University	165	75%	In Class	
Duff	Paisley University	-	93% and 90%	In Class	Two samples
Booth, Lockett, and Mladenovic	Macquarie University/University of	530 Combined	70.6% Combined	In Class	Surface scores for two groups: 52.4/50.8 Deep scores for two groups 41.2/42.6
Byrne, Flood and Willis	City University Dublin	110 Acctg 190 Business	82% 57%	In Class	No differences between sample and group
Hassall and Joyce	CIMA	All CIMA students	27%	Mail	The population was the student body of the Chartered Institute of Management Accountants (CIMA)
Davidson	Canadian University	305	75%	In Class	
Byrne, Flood and Willis	City University Dublin	110	86%	In Class	

**Table 7-2 – Further Details of the Accounting Studies**

Tables 7-1 and 7-2 show the mixture of responses common in the approaches literature. Deep and surface scores are shown where available. In terms of actual scores, the range of results displayed in the studies is wide but some evidence to support the instruments arises from the similarities observed where the study involved two separate groups - for example Byrne *et al.*'s first two studies, three years apart, show almost identical results. The differences between results found in the studies are likely to be due to the variety of presage factors, which in turn suggests that these factors dominate intra-subject differences. Most of the studies did not quote differences between year of study, gender, and age but even if these factors were not relevant the number of countries involved and the likely varieties of teaching found therein are sufficient to have generated the differences observed.

Overall the studies show a small preference for a surface approach (Bowen *et al.*, 1987; Eley, 1992; Booth *et al.*, 1999; Davidson, 2002) within accounting but this was by no means universal and surface and deep scores were generally similar. Table 7-1 indicates a wide spread of institutions and countries, and response rates are high. As in the present study, all the researchers – other than Bowen *et al.* and Lucas – used one of the established questionnaires; most handed out questionnaires in class though none followed up the questionnaire with interviews to give more depth to the findings.

The individual studies are discussed in more detail below.

### 7.3.1 STUDIES NOT UTILISING ASI OR SPQ

A small number of the studies did not utilise the ASI - or one of its variants – or the SPQ. Bowen *et al.* devised a questionnaire quite different from the ASI/SPQ family to compare the tendency of students in a range of eleven university departments to engage in '*superficial learning*' as compared with '*learning for understanding*'. The survey was based on a questionnaire sent to a random sample of 800 first-year students of whom 638 students responded. Bowen *et al.* found the accounting students to have the lowest score of all the departments on the '*learning for understanding*' scale and the highest on the '*superficial learning*' scale but it should be emphasised that this was using an unvalidated instrument and the study was not replicated elsewhere.

Unfortunately no details are now available about the Chan *et al.* study – it is reported as a reference by Booth *et al.*.

Tan and Choo (1990) is the only accounting study to utilise the ILP (Inventory of Learning Process), an instrument devised in Holland (Vermunt and van Rijswijk, 1988; Vermunt, 1998) and similar to, but much less widely used than, the ASI family or SPQ. On the basis of two subscales derived from the instrument, the students were split into two groups approximating to deep and surface learners. Unfortunately the paper provides no details about how the students were selected nor how large was the population.

Lucas's study is one of the few genuinely phenomenographic ones in the literature and used only interviews unsupported by results from one of the instruments. Her small sample of first-year business students split into two distinct groups: three students took a distinctively relational (deep) approach to study; the remainder saw their learning as fitting problems into a format rather than looking for any inherent meaning.

### 7.3.2 ACCOUNTING AS PART OF A LARGER STUDY

Two major surveys, Eley (1992) and Gow, Kember and Cooper (1994), included evidence from accounting students as one subject amongst a number of others. Eley's study was conducted with Australian students and Gow *et al.*'s with students in Hong Kong. Eley found accounting students tended to take a more surface approach to learning than the average and that accounting students had the lowest level of metacognition of all the groups studied.

Eley used the SPQ to test 152 second level students in a range of disciplines;

In his study, the approach scores were:

<i>Accounting</i>	Surface	52/50	<i>Average</i>	49/42
	Deep	34/41		40/42
	Achieving	40/41		41/41

The two figures relate to two groups of students studying on different courses; thus the accountants were above average surface and below average deep for both groups. Learning approach was compared with the way each course had been presented. A deep approach was found to be fostered by an environment supportive of student learning, clear goals and structure, and focus on the mental process of learning; Eley found that the same students used different approaches in different courses suggesting the SPQ to be context sensitive. Gow, Kember and Cooper, also used the SPQ, but did not replicate Eley's findings; their students had '*somewhat higher scores on the deep approach scales and lower scores on the*

*surface approach scales than Australian Science ..students'* (p123) and overall the students had a higher deep than surface score.

### 7.3.3 ASI AND SPQ STUDIES

Byrne, Flood, and Willis (1999, 2002) used the ASSIST instrument to examine Irish accounting students. They found the expected distinctions between surface, strategic, and deep approaches, with no particular one being favoured (Table 7-3), but accounting students tended to generally have higher deep than surface scores. They later extended their studies to incorporate students in the US (Byrne, Flood, and Willis, 2004) with similar findings. Sharma (1997) worked with a sample of second year accounting students. His students were '*not distinctively surface or deep*' (p142) and they were generally syllabus bound with a fear of failure – both sub-scales of the surface approach. Duff (1999), in Scotland, studied two samples of second and third year students taken a year apart. The samples represented response rates of over 90%. Duff does not quote scores for the total sample but it is evident from his gender breakdown that the deep score was about 38 and the surface 33 – indicating a weak preference for a deeper approach.

	1999			2002
	Accounting	Business	Overall	
<i>Deep</i>	13.07	12.8	12.93	12.75
<i>Surface</i>	11.88	12.87	12.42	12.18
<i>Strategic</i>	13.05	12.09	12.54	12.73

**Table 7-3 – Results from Byrne et al. (1999, 2002)**

Davidson's (2002) Canadian students recorded a deep approach score of 48.7 and a surface one of 50.6. Davidson quotes standard deviation figures for the two scales of about 6, so clearly the two approaches are not significantly different.

There has been only one questionnaire-based study of professional accounting students. Hassall and Joyce (2000) compared 547 UK based and non-UK based students for the Chartered Institute of Management Accountants (CIMA) examinations. They found the expected surface/deep approach, the deep approach being predominant. The deep approach was at its lowest for the third level of the four-stage Chartered Institute of Management Accountants (CIMA) examination regime. The surface approach differed significantly between UK and overseas students. For the latter, the surface score fell over the four parts,

for the former it rose up to level three and fell back again at level four but students joining the course at different levels may have affected the results.

Booth, Luckett, and Mladenovic (1999) in Australia noted that:

*'Australian university accounting students had significantly higher surface approach scores and lower deep approach scores than documented norms for Australian arts, education and science university students. Also, while the difference was not quantifiable, they were also more surface learning-oriented than Hong Kong polytechnic students' (p295).*

However, the norms referred to are derived from Biggs (1987) and so may not have been current in 1999. This should be taken in the context of Watkins and Hattie (1981)

*'arts students were the most likely to show intrinsic interest in their course and to adopt a deep-level approach to their work. Scientific students tended to be relatively more motivated by vocational concerns and to adopt surface-level reproductive study methods' (p392).*

This quote suggests that accounting students should fall into the general classification of more scientific students.

## **7.4 APPROACH AND PRODUCT**

Different approaches to learning should lead to different products, though the model also allows that different products may generate different approaches. Product, or outcome, can be measured in terms of passing a course, the level at which the pass is achieved, or by attaining a given SOLO level.

### **7.4.1 APPROACH AND LEVEL**

A number of accounting studies have compared performance and approach. Sadler-Smith (1996) tested 245 business studies students using the RASI. Although there was a significant (1% level) 25% correlation between deep score and aggregate mark on the course – rising to 46% in accounting – there was little correlation between approach and individual items of assessment and on other approaches. Other papers have found a mixture of effects: Eley (1992) found a (negative) correlation between surface score and performance and a

positive one between deep and performance; Booth *et al.* (1999) and Ramburuth *et al.* (2004) found a similar correlation with the surface approach but none with a deep approach; contrariwise Duff (2004b) and Davidson (2002) found the reverse, a positive correlation with deep approach but none with surface, though in the latter case it was only with complex examination questions; whilst Byrne *et al.* (2002) found both correlations for female students but none with male.

Tan and Choo (1990) showed that the deep and surface approach groups described above were significantly different at the 1% level in their performance in both an in-class test and end of year examination.

Gow *et al.* (1994) found that the deep approach for accountants declined sharply in the first year and rose thereafter, though still remaining well below its initial level. For Gow *et al.*'s other students the initial pattern was similar but no upturn in score was observed. No comment was made on the surface scores.

#### 7.4.2 APPROACH AND SOLO LEVEL

Only two accounting based studies have involved SOLO classification:

Ramburuth and Mladenovic (2004), using a modified version two-factor (deep and surface approach) version of the SPQ and a large (810 and 743) first-year student sample found a correlation between aggregate first year academic grades and a surface (but not deep) orientation to learning and also found a significant positive relationship between grade and incoming SOLO classification. Ramburuth and Mladenovic did not relate approach to SOLO classification.

English, Lockett, and Mladenovic (2004) attempted, with some success, to intervene to improve students approach scores, increasing the deep score and lowering the surface, but the effect on performance was small. English *et al.* concluded that '*the impact of learning approaches on performance in terms of final assessment grades is, at best, marginal*' (p 477).

## **7.5 SUMMARY AND CONCLUSIONS**

Evidence from accounting echoes that from the studies more generally. Deep and surface learning are widely observed but the links between presage factors and approach, presage factors and product, and approach and product are mixed and inconclusive.

For the moment it is accepted that a distinction between deep and surface understanding of a subject exists. The issue as to whether the difference in understanding arises from deep and surface approaches to learning remains to be resolved - regardless of whether these approaches to learning can be measured by a questionnaire. Before moving on to the methodology of this study, the next chapter considers accounting as a subject and what a deep (SOLO relational or extended abstract) understanding of it might look like – this will be needed inform the construction of instruments used later in the study.

## **SECTION THREE – MANAGEMENT ACCOUNTING**

# Chapter 8 – Management Accounting: The Subject

## 8.1 INTRODUCTION

The literature review thus far has focused on Student Approaches to Learning. This section and chapter introduce the academic subject under question in this dissertation - management accounting. The first part of the chapter, section 8.2, discusses the background to accounting education in general and management accounting education in particular. Section 8.3 describes the methodology used in this study to find out what currently constitutes a course in management accounting. Section 8.4 carries out that investigation and uses the information gained to produce two concept maps of management accounting as a subject. Section 8.5 concludes and summarises the chapter.

## 8.2 ACCOUNTING EDUCATION

Bromberg (2005) suggested three conceptual paradigms underpinning management accounting:

- A mechanistic vision suggests that the organisation absorbs inputs (of labour, materials, and overheads) and combines them to produce products. The role of the management accountant is to financially model that behaviour and, by measuring appropriate outputs from the model, provide advice to managers about how to change inputs and thereby control outputs.
- A behavioural view - the second paradigm - accepts the mechanistic view but believes the relevant model must be extended to include behavioural and organisational parameters.
- The third paradigm seeks to understand the role of firms as organisations within society.

The first two paradigms involve management accounting academics seeking to explain how managers (should) make decisions based on the information flows they receive. These information flows are of two types that broadly match the first two paradigms. The first assumes mechanistic relationships between financial variables and seeks to understand how these relationships are constructed. The second assumes an organisational/behavioural perspective and seeks to understand how the individual managers involved react to the

various pressures they are under: their intrinsic motivation, the internal and external environment they face, and the restrictions placed on their activity in their capacity of agents working for an external principal. This makes for much more uncertain flows of information and complexity of response.

The relationship between accounting theory and practice is imprecise. In the US, advanced study has largely taken the mechanistic route of modelling greater complexity; Europe on the whole has taken more a more sociological perspective and either analysed financial behaviour in a Marxist, or neo-Marxist perspective, or studied individuals holistically as they work, adopting a phenomenological perspective.

It is clear that accounting practice is very largely concerned with the mechanistic perspective. Developments in many cases have been logical extensions of existing simpler techniques. Thus absorption costing is a precursor to activity based costing, and contribution per unit of limiting factor to the theory of constraints.

Expertise in management accounting is a prerequisite for any qualified accountant yet the subject lacks a coherent body of theory supported by research. Herring (2003) commented that:

*'Academic accounting has gone from practice-based to academic-based but has never achieved a proper uniting of theory and practice because of a **failure to base teaching on concepts.**'* (p88, author's emphasis)

The lesson for educators is unclear. Should universities teach what industry tends to use, develop more complex models, focus on a behavioural perspective - implying the use of models whose outcome is uncertain and where there is no right answer - or seek a deeper understanding of the sociological perspective? Moreover, it is not clear that to appreciate the behavioural perspective it is necessary to (fully) understand the mechanistic one.

### 8.2.1 MANAGEMENT ACCOUNTING AND ACCOUNTING EDUCATION

Management accounting as a taught subject is relatively young; it originated with the teaching notes, and later a book, by Vatter (1950) towards the end of the 1940s. Later the teaching focus swung away from its original concern with cost information towards decision and *'the research and teaching arms of the field grew further and further apart'* (Maher, 2000; p338) in the 1960s. By the 1980s *'a substantial share of the management accounting*

*literature published in top journals in the United States applied agency theory concepts... yet little of this material was found in the top selling management and cost accounting texts' (op. cit., p338).*

Through the second half of twentieth century a significant debate took place - particularly in the United States - about the appropriate relationship between professional and academic accountants (Tan, Fowler, and Hawkes, 2004). The consensus arrived at during the 1990's (Sundem 1999; Big Eight Accounting Firms, 1989; American Accounting Association, 1986; American Education Change Commission, 1990) was that accounting education cannot simply be about learning a body of knowledge but must be more about preparation for life working as an accountant. Students should be learning a set of competences to prepare them for the profession rather than a set of specific accounting skills.

*'Programs that focus on management accounting need to broaden to cover the full gamut of what goes on in a business's finance' (Swanson 1999, p6).*

and

*'[The] role of the management accountant must move from collector and presenter of financial data to team member and change agent. Management accounting systems must move from transaction-heavy inspection and reconciliation engines to lean and vital providers of business insight.'* (Maskall and Baggaley, 2000).

Rather than simply make accounting degrees longer, there has been recognition that a combination of undergraduate and post graduate study is appropriate. One result has been the move, on both sides of the Atlantic, to graduate-only entry to the accounting professional bodies - though very many recruits to the ACCA'S student body do not possess undergraduate degrees - and a reclassification of the final level of the accounting professional qualifications as postgraduate.

Albrecht and Sack (2000) sounded a warning:

*'In too many respects, accounting education is being delivered the same way today as it was 20 or 30 years ago' (p8)*

The main thrusts of Albrecht and Sack's argument were that accounting education was not keeping abreast of changes in the business environment and that it was no longer proving

sufficiently attractive to students, so the number of accounting students in US universities was declining. Although the drivers are not identical in the UK, similar concerns about accounting education exist here also.

However, even in the US, the move away from teaching traditional accounting procedures has been slow. Diller-Haas (2004) reported only 29% of Business Schools in the New York Metropolitan area had changed their first year curriculum as a result of the ongoing debate. By implication the number in the UK would be much smaller.

### 8.2.2 SUMMARY

The content and scope of management accounting as a subject depend as much on judgement as on a precisely defined conceptual framework. To establish what an individual who claims expertise in the subject should know - whether it should be understanding of complex financial models or a more behaviourally focused understanding – is not well-defined in the accounting education literature. In the context of the present study it is necessary to discover how exactly the subject is currently being taught to be able to assess the performance of either of the two groups of students under consideration.

### 8.3 THE CONTENT OF MANAGEMENT ACCOUNTING – THE METHODOLOGY

Having expertise – the highest SOLO level – in management accounting implies understanding the complex relationships underpinning the subject. To assess that expertise it was necessary to analyse the content of the subject as taught. Three sources were used to provide data about what constitutes the appropriate content of a management accounting syllabus:

- the syllabi of the Institute of Chartered Accountants of England and Wales (ICAEW), Association of Chartered Certified Accountants (ACCA), and the university concerned;
- past examination papers of the three bodies;
- current management accounting textbooks.

The data were used to derive a common conceptual framework indicating what would be a body of knowledge appropriate to an ‘expert’ in management accounting. From an initial examination of these sources a set of conceptually related topic headings was drawn up and textbook chapters, examination questions, and parts of the syllabi listed under each.

Initially, it was necessary to iterate the process a number of times to arrive at a reasonable balance between headings that were: conceptually separate but linked, represented on the syllabi, and had been examined a reasonable number of times. After study of examination papers going back more than thirty years – and more than forty in the case of the ICAEW - and the syllabi over a similar period, it was possible to arrive at the list of topic headings described in the next section.

From the information gained it was possible to derive a concept diagram depicting the relationships that underpin the subject of management accounting. This was then available to be used as a benchmark against which understanding of management accounting could be measured.

#### **8.4 MANAGEMENT ACCOUNTING AS CURRENTLY TAUGHT AND ASSESSED**

This section seeks to explore what is currently being taught and assessed by the two major professional accounting bodies and one major UK university described above. The topics taught and assessed are investigated and an underpinning coherent conceptual framework derived.

##### **8.4.1 INTRODUCTION**

Management accounting as a subject name first appeared in the mid-1970s for the ACCA and for the ICAEW in 1980. Previously it had various names all incorporating the word costing. However the gap in content between ‘Advanced Costing’ in 1970 and ‘Management Accounting’ in 1975 is more about the addition of a section on ‘Information Systems’ than any more radical change. The earlier syllabus for example contains a section on ‘analysis and use of variances for policy and administration’ that is clearly aimed at the use of costing information. In practice the syllabus for the subject – whatever its designation – has remained relatively unchanged for much of the last half century.

The ICAEW traditionally comprised two compulsory levels of management (cost) accounting, usually intermediate (PE1) and final (PE2). The ACCA has also had two papers or part-papers; as with the ICAEW parts of the syllabus have sometimes moved into other papers. Currently<sup>11</sup> the ACCA has an optional Management Accounting paper at level three.

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<sup>11</sup> 2006

For the purposes of analysing a 'typical' management accounting syllabus, all the University papers were considered, since within its modular framework all are compulsory for one degree or other. Only the compulsory ACCA papers were included in the analysis below. The management accounting papers are compulsory for all ICAEW students. In practice, subject to the relatively minor differences noted below, the syllabi and examinations of the three bodies cover very much the same ground.

#### 8.4.2 THE SYLLABI AND EXAMINATIONS

It was evident from the published syllabi that a trend over time to greater exposition and clarity has been a bigger factor in writing courses than any significant change in content. Thus, the ACCA up to 1980 had the simple category '*process costing*'. By 1982 this had been expanded to include '*cost units, transfers, ledger entries*', the current version<sup>12</sup> includes: '*characteristics .. direct and indirect costs ... valuation of process transfers and work-in-progress .. process costing normal losses, abnormal losses and gains .. joint and by-products*' but there is no suggestion that these were not all incorporated in the pre-1980 expectations of the student. In comparison, the Institute of Chartered Accountants of England and Wales (ICAEW) statement's tend to conciseness; the whole 1960 cost accounting syllabus at intermediate level was simply the '*objects and principles of cost accounting*'. In more recent years the tendency has been away from specific topic elements but towards a split between **knowledge, application** e.g. '*solve familiar or unfamiliar problems*', and **higher skills**, e.g. knowledge, comprehension, application, analysis, synthesis, evaluation. This compares with the QAA (2000) benchmark statement on accounting, which identifies: **basic knowledge and understanding** '*some of the contexts in which accounting operates*', '*ability to use the current technical language to describe practices of accounting*'; **cognitive abilities and skills** '*be able to record and summarise straightforward transactions and other economic events*', '*to a basic level of achievement*'; and **situations** '*simple*' and '*complex*' though no complex situations are identified in the benchmark statement.

A potential cause for the difference between the two groups of students investigated here is that the syllabus one group was studying reflected new developments in the subject. It was not possible to identify any specific trends over the period studied, though the ACCA syllabi show a tendency to include behavioural issues from the 1980s onwards, a trend evidenced by only a couple of mentions in the current versions. The more complex areas, such as

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<sup>12</sup> 2006

advanced costing techniques and performance management issues also appeared more regularly from the 1980s, both in syllabi and questions. A small number of issues were clearly of their time; thus content about the effect of strikes appeared – and disappeared – with the 1970s. This, combined with the analysis of ICAEW papers going back to only ten years after Vatter’s book was published, suggests that the results derived below represent a consistent - and relatively immutable - view of the subject as it currently exists.

#### 8.4.3 A “MIND MAP” FOR MANAGEMENT ACCOUNTING

From an analysis of all the available examination papers and the syllabi discussed in the previous chapter, more than a hundred and fifty separate topic areas were identified (Appendix 3). It was possible to fit these into the summary areas listed in Table 8-1. Figures 8-1 and 8-2 constitute an attempt to create a schematic representation of the whole subject of management accounting as taught.

Taking Figure 8-1 first:

Since the essence of the subject is about management decision making, the diagram starts from an organisational viewpoint. Contingency theory and institutional economics suggest the driver for the whole structure should be the type of organisation and, apart from questions directly pertinent to the information system and its structure; the provision of information will be driven by the type of organisation. These areas are subsumed under the general heading ‘Management Accounting and the Organisation’. Management decisions are critical; these form the rest of the box called ‘Management Accounting and the Organisation’ in Figure 8-1 and the top of Table 8-1. To the extent that management implies knowing the results of decisions made, performance management must be a *sine qua non*; it lies between management and the decisions made. Decision-making is split into short and long-term. This follows the financial accounting view based on a Balance Sheet recording an organisation’s net worth and an Income Statement recording growth of net worth (i.e. income) between two balance sheet dates. The Profit and Loss Account is normally produced annually for statutory reasons, but not otherwise necessarily, and this leads to a generally taught split within the subject between producing information necessary for short-term (shorter than one year) decisions and long-term decisions.

<b>Management Accounting and the Organisation</b>	<b>Organisation of Department/Bookkeeping</b>
	<b>Management Accounting</b>
	<b>Management Decisions</b>
	<b>Information Systems</b>
	<b>Organisation Types</b>
<b>Long-Term Decisions</b>	<b>Techniques</b>
	<b>Risk, Uncertainty, Other</b>
<b>Techniques</b>	<b>Decision</b>
	<b>Statistical</b>
<b>Costing</b>	<b>Costing Systems</b>
	<b>Cost Types</b>
<b>Planning and Budgeting</b>	<b>Budgeting</b>
	<b>Standard Costing</b>
	<b>Variance Analysis</b>
<b>Performance Management</b>	
<b>Divisionalisation</b>	
<b>Advanced Systems/Techniques</b>	
<b>Strategic Management Accounting</b>	

**Table 8-1 – A list of major topic headings derived from the hundred and fifty topics identified in Appendix 3**

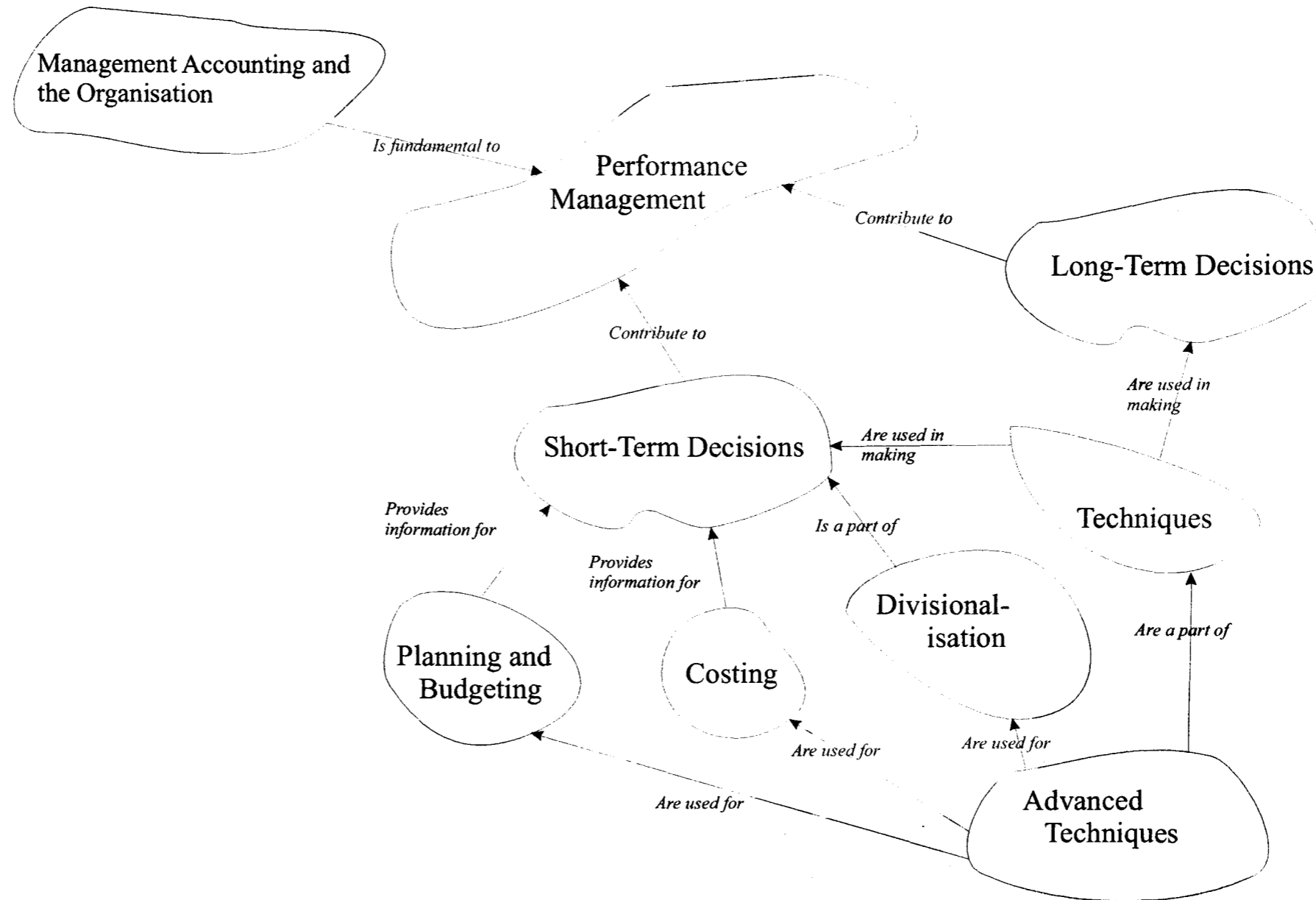


Figure 8-1 – A schematic representation of management accounting as a subject area based on the topic areas listed in Table 8-1

Traditionally planning and budgeting are annual activities and therefore short-term in nature. Although long-term strategic planning is occasionally taught at final year or postgraduate level this is more usually seen as a part of marketing courses. Costing is also normally a short-term activity, though Johnson and Kaplan – whose book (Johnson and Kaplan, 1987) has had great influence on the development of management accounting as a subject - would dissent from this view, believing that lifecycle costing should be the norm (*op cit* Chapter 10). Divisionalisation relates to issues of performance and transfer pricing and generally contributes to annual performance issues. As Figure 8-1 indicates there are a number of techniques that relate to either or both of the two decision periods.

Figure 8-2 expands on the schematic representation of Figure 8-1:

Organisational issues encompass a wide range of behavioural and other factors on which performance is contingent. They feed naturally into the subject independent of the period involved.

Performance management is the *raison d'être* of management accounting; it is shown receiving information from the two key decision making areas<sup>13</sup>.

Within short-term decision-making fall the costing and planning and budgeting areas already noted, broken out into their constituent parts. Costing, and planning and budgeting, are fundamental to the subject – they formed its earliest preoccupation. Costing divides into traditional systems and techniques associated with modern manufacturing; both rely on a fundamental division into the elements of cost: material, labour, and overheads, and also the behaviour of costs as output rises. Standard costing and variance analysis can best be seen as subsidiary to planning and budgeting since they both form a part of the budgetary control system. A series of specific techniques on the left of the diagram contribute to short-term decision-making.

Long-term decision-making encompasses resource allocation – generally investment appraisal decisions. The subject as taught comprises largely techniques of investment appraisal supported by some specific issues of risk and uncertainty.

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<sup>13</sup> And gives a name to the replacement for paper 2.4 in the ACCA's revised 2007 syllabus.

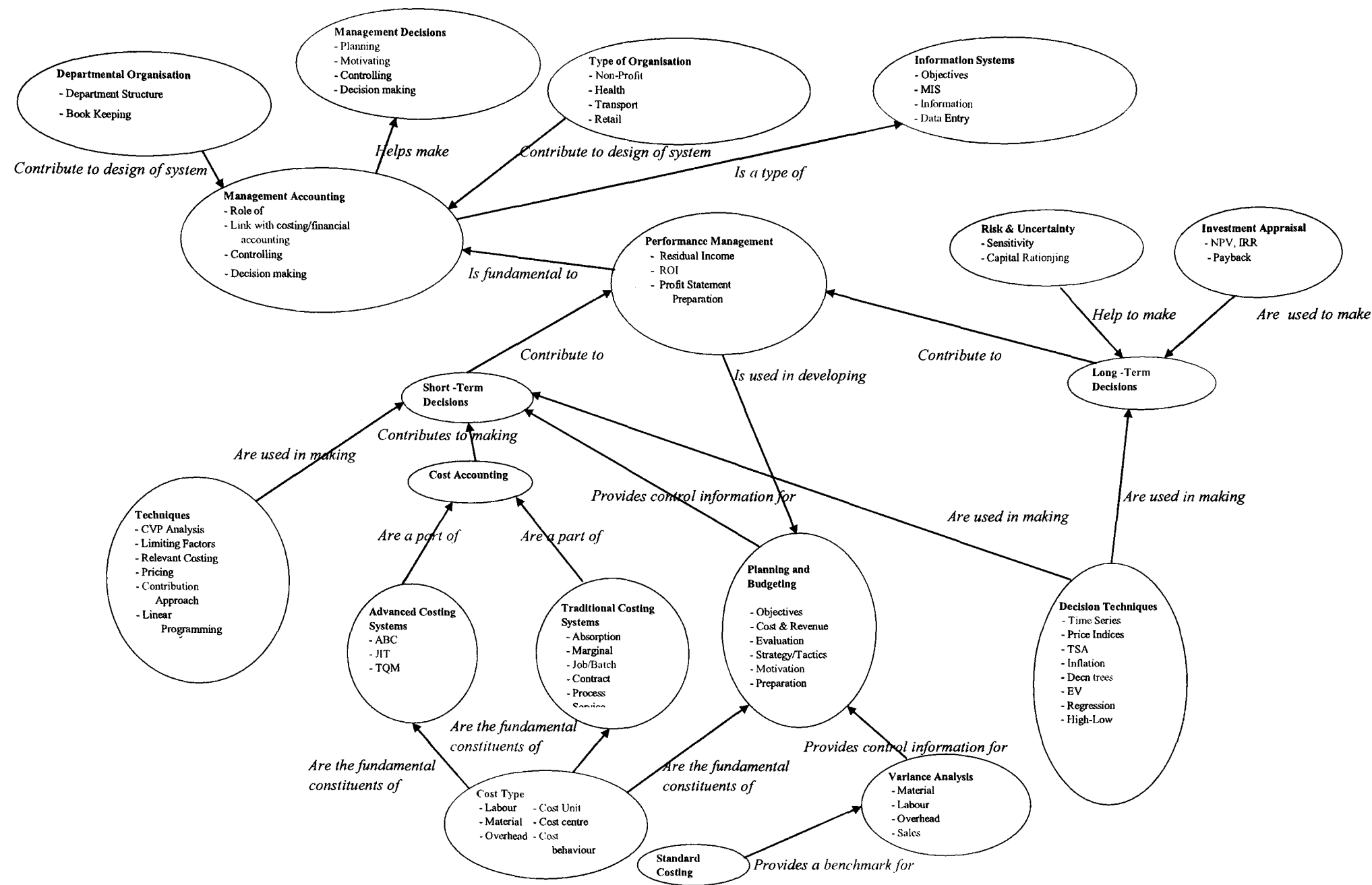


Figure 8-2 - A more detailed concept diagram (mind map) showing a schematic representation of management accounting as a subject area derived from Table 8 -1 and the topics listed in Appendix 3

In addition to the above is a set of techniques that can be used to support either short or long-term decision making, as listed towards the bottom right of the diagram.

Figure 8-2 does not cover the last three items of Table 8-1, which may be considered more advanced areas and, as is clear from Table 8-2, not mainstream areas in terms of teaching. Although divisionalisation issues have been around since the 1920s, the techniques involved in inter-divisional pricing are complex and not often taught except at the higher levels. The modern manufacturing advanced techniques and strategic Management accounting are essentially the children of a post-Johnson and Kaplan (1987) era.

## **8.5 SUMMARY AND CONCLUSION**

This chapter concludes the literature review. The concept diagrams developed provide an understanding of what is currently perceived as constituting a course in management accounting. Using the diagrams it is possible to assess to what extent a student possesses expertise - equivalent to the highest SOLO levels - in the subject.

The next section and chapter develop the research questions that emerge from the literature surveyed in relation to this study and describe the various methodologies to be utilised in this dissertation

## **SECTION FOUR – METHODOLOGY**

# Chapter 9 – Methodology

## 9.1 INTRODUCTION

This dissertation addresses the issue that two groups of students studying cognate courses at the same institution achieve quite different results. Chapter Two discussed the various models of student learning and concluded that the presage/process/product model - a part of the Student Approaches to Learning framework - was the best currently available for the purpose.

Chapter Three discussed the presage factors expected to contribute to students' appreciation of the context of their learning within the SAL framework. Considerable numbers of presage factors have been put forward; the model does not suggest which are most likely to contribute to the student's approach to learning or what the magnitude of their contribution might be. One element of this study will be to discuss these presage factors with a sample of students to ascertain which presage factors are most significant in terms of differences between the two student groups.

Chapter Four discussed the various psychological instruments and their development. For the reasons described there, ASSIST is the most appropriate to use here but its use is problematic; concerns about the model were noted particularly on page 56. The early studies on deep and surface learning either used interviews alone or related interview and questionnaire results to achieve a greater understanding of student learning. It is clear that results from questionnaires alone cannot give a complete understanding of student learning but, despite the criticisms, the ASI and SPQ have been widely used to investigate learning in higher education over the last twenty or more years. Because of the question marks surrounding use of the instrument, and because some of these students are studying in a part-time mode, it was important to supplement the outcome of the ASSIST factor analysis with interviews to triangulate the findings - to probe what 'deep' and 'surface' learning actually meant to the students.

The interviews were also used to gain greater depth of understanding of those factors that might have contributed differentially to the learning of the two groups - in particular to the difference in presage factors noted above.

The research discussed in Chapter Five suggests a complex relationship between approach to learning (as measured by ASSIST) and the product of that learning. Any investigation needs to treat passing assessment and SOLO level of understanding separately. This material is linked with that of Chapter Eight, which established a benchmark against which performance in management accounting can be measured.

The assessment of student understanding demands knowledge of how that understanding is normally assessed and whether the assessment differs for the two groups of students involved. A study was made of past examination papers for both the ACCA and university concerned, plus a second professional accounting body against which the first two could be compared in the event of any discrepancy. This study enabled a norm to be established concerning the expected content of a course in management accounting.

Two tests were carried out. The first explored how the ASSIST factors relate to examination success - whether they have any explanatory power. In the second, a case study approach was used to probe students' understanding and to test for any correlation between understanding and ASSIST score. In other words, although an attempt was being made to use ASSIST as a tool, at the same time its validity as a tool was not accepted unconditionally. The psychological inventories have been widely used as tools in the literature as part of a positivist methodology but ASSIST was designed only as a diagnostic tool to help students improve their performance. A key part of this study is thus an assessment of its validity in the context of investigating comparative student performance. This sets the study apart from others, particularly those in accounting.

In summary: the study uses the SAL model to investigate the learning process of students studying accounting for a professional qualification and for a degree in accounting. The 3-Ps model suggests three areas within which the problem should be studied:

- one or more presage factors may be different between the two groups, leading to the two having different approaches to their learning. The presage factors may be those inherent in the student, or those affecting the learning context;
- if the model is correct, the process of (approach to) learning ought to be different between the two groups;
- since the product of learning is clearly different, the relationship between approach and product is also important. Whether a deeper approach leads to a higher quality product is key to the investigation.

The next part of this chapter, section 9.2, discusses how the students' approach to learning was measured using the ASSIST questionnaire. Selection of the sample used is explained first, then the factor analysis itself, and finally the use of a cluster analysis used to triangulate the findings from the factor analysis.

The third part of the chapter, section 9.3, covers the follow up interviews used to investigate presage factors and support the ASSIST findings. The first part describes how the sample of students interviewed was drawn and the second describes the protocol for the interviews.

Sections 9.4 and 9.5 are concerned with the relationship between approach to learning and product. Section 9.4 describes how examination results are related to learning approach and section 9.5 discusses the case study approach used to establish the depth of understanding achieved by students.

Section 9.6 discusses ethical issues and section 9.7 researcher and response bias issues. The chapter closes with a conclusion and look forward to the remainder of the dissertation, section 9.8.

## **9.2 MEASURING APPROACH TO LEARNING USING THE ASSIST QUESTIONNAIRE**

### **9.2.1 SAMPLE FOR ASSIST QUESTIONNAIRE**

Over a three-year period (2003-2006) the ASSIST questionnaire was delivered to a sample of 401 students at the university; two hundred and fourteen full-time undergraduate and one hundred and eighty seven part-time ACCA students. The former were taking first, second, and third-level management accounting modules on a variety of degrees and the latter split between the ACCA level one module Financial Information for Management and the level two module Financial Management and Control; with a small number from the level three paper Performance Management. The first two levels of ACCA are equivalent to the first three levels of a degree programme; level three of ACCA is equivalent to a postgraduate qualification.

The population of ACCA students at the university comprises a broad range of abilities and is thus probably typical of ACCA students in general. Many are from the East End of London, an impoverished area financially and educationally but a natural catchment area for the university. Alongside them sit classmates working at firms in the City of London, some

of whom have a very strong academic background and often an accounting degree. Many of the undergraduates tend to be relatively weak intellectually - the university falls towards the bottom end of most league tables - but a significant number are stronger students from overseas, for whom the attraction of a university in London is important. The number of overseas students in the population may have affected the results of this research, though ACCA examinations are sat worldwide and the number of overseas students in UK universities has also risen significantly over the last decade.

In each case, and in common with nearly all the studies listed in Table 7-1, the questionnaires were handed out in a class and, unlike those studies where mail was used, collected in during the same class. The ACCA students were almost all being taught by the author and response rates were very high, close to 100% in most cases; for the undergraduate students, response rates were lower, because many students did not complete the questionnaires, but still usually represented a majority of the students in each class. The ACCA students were taught in small groups of twenty to thirty and questionnaires collected from eleven of these classes. The undergraduates groups were of mixed size, some being large lectures of around seventy students and others seminar classes of a similar size to the ACCA groups; seven groups of undergraduates completed the questionnaires.

#### 9.2.2 ANALYSIS OF ASSIST RESPONSES

The ASSIST questionnaire responses were analysed using the factor analysis programme in SPSSPC. Although there is no consensus on sample size, many sources (Gorsuch, 1983; Coakes and Steed, 1999) suggest that successful factor analysis demands a minimum of five responses per variable with a minimum of a hundred responses. There are fifty-two questions on the instrument, so this implies a minimum of 260 responses making the sample large enough to draw significant conclusions. Suitability for factor analysis was tested using the Kaiser-Meyer-Olkin measure (KMO) and Bartlett's test of sphericity.

The two methods most commonly employed in factor analysis are principal axis factors (PAF) and principal components analysis (PCA). Beauducel (2001) commented that '*PAF ... may be regarded as [the] optimal compromise between sensitivity to dissolved factors on the one hand and stability of results on the other*'.

The two most common methods of rotation used for factor analysis are Varimax and Oblimin, the former assumes orthogonality of the factors, the latter assumes an oblique relationship, meaning there is correlation between them. The British approach has tended

towards assuming orthogonal factors, reflecting a natural science view that factors should be independent. In the US oblique factors are more commonly assumed, recognising that in human affairs there is more likely to be a correlation (Child, 1990).

Factor scores below 0.3 have been ignored in the results shown in the Tables of results presented in Chapter Eleven. Although this is the usually accepted value, Comfrey (1973) suggested that anything above 0.4 should be considered salient.

Factor pattern coefficients represent the relationship of a specific variable to a specific factor without the influence of other variables (Stevens, 1992). The factor structure coefficients can be thought of as being identical to structure coefficients in other types of correlational analyses. These coefficients show the correlations of the variables with the factors (Hetzl, 1995). Since the pattern and structure coefficients are related by the angle of rotation of the factor axes the two show a consistent pattern but Child (1990) noted, *'If you wish to get a better idea of how items contribute across factors...then a P[attribution] matrix is preferable..[the] loadings allow for the correlations which exist between the factors whereas the [structure] matrix values do not. A P[attribution] matrix defines the factors'* (p58).

### 9.2.3 CLUSTER ANALYSIS

One way of discriminating between the two groups of students under consideration was to examine the results of factor analyses of the responses to the ASSIST questionnaire for the two groups. To support this analysis, results from the factor analysis were tested using a cluster analysis. This analysis could identify groups of students with similar approach to learning characteristics. A 'k-means' cluster analysis was carried out using the SPSSPC statistical analysis package. The software allows the data to be forced into a specified number of clusters to be examined. Following Entwistle, Tait, and McCune (2000) the data were analysed twice, once into eighteen clusters and the second time into six clusters.

## 9.3 THE FIRST INTERVIEWS – THE PRESAGE FACTORS

### 9.3.1 INTERVIEW SAMPLE

In an attempt to triangulate the ASSIST findings with the students' beliefs about learning, and to examine the presage factors in more depth, a sample of students was invited to take part in a series of semi-structured interviews. A question was added to the version of the ASSIST questionnaire used in the study asking students if they would be prepared to attend

for an interview. Thirty students - 7.5% of the total who had completed the ASSIST questionnaire - equally divided between the ACCA and undergraduate groups, were selected for interview. An effort was made to create a stratified, random sample of interviewees; equal numbers being drawn from the two groups of students, and at each of the three academic levels. In many cases the potential number of interviewees was only one – in other cases students were contacted randomly. Although the sample was randomly chosen from the volunteers, only a relatively small number of students actually volunteered for interview.

### 9.3.2 INTERVIEW STRUCTURE

Marton and Säljö (1976a and 1976b) pioneered the use of the semi-structured interview in their phenomenographic studies and this methodology was developed by Entwistle and Ramsden (1982). Entwistle and Ramsden (1982) carried out their semi-structured interviews by asking a '*broad range of questions in three groups*' (p 133); the three were questions about problem solving, assessment strategies, and the learning context - covering areas such as teaching assessment and the purpose of lectures - although students were also allowed considerable freedom within this framework to discuss their learning. This basic methodology was followed in the student interviews in the present study though these students were also asked about specific presage factors that might have had an effect prior to the course's commencement.

In terms of the interview protocol, the central research question was 'how do presage factors affect learning'. Thus the key questions asked the student about their presage factors (section 7.2) and method of learning. Specifically on presage factors: -

Background and educational experience: place and nature of former education; difference between UK and home country study (for overseas students) were discussed and why they had chosen accounting as a course, conception of learning, view of the purpose of learning, the general context of their learning, and relationship with the teacher;

and, on learning:

How they approached learning a new topic; whether they saw themselves as deep or surface learners (the terms were briefly explained to them), whether they worked outside the university (for the undergraduates), the relationship between work and study, whether they were serial or holistic learners in their mode of study.

Many of these areas were addressed as part of a general discussion but several were questioned more specifically:

One of the most significant presage factors is the student's conception of learning. Interviewees were shown Säljö's categories of conceptions of learning and asked which definition – if any – matched their own definition of learning.

They were also shown a series of possible purposes of learning derived from Lucas (2001) '*To learn about the real world of business*', '*to pass examinations for future career*', '*to learn the subject for itself*' and asked which of these, or any other they wished to suggest, best explained their purpose in learning accounting. They were also asked how they studied generally and whether learning accounting was perceived as different from learning other subjects.

The students were asked what they looked for in a teacher, the best aspect of a teacher, the relationship between teacher and student, the depth of their studies (they were shown the Nowak and Gowin diagram Figure 3-3 as a guide here), whether they found the work and assessment onerous, and whether there was sufficient choice of subjects in their course.

The interview commenced with an explanation of the purpose of the research – that it was about the difference between ACCA and undergraduate accounting students. Each student was asked about their background, they were then asked – as did Entwistle and Ramsden – how they went about learning a new topic. From there the discussion usually proceeded to discuss other issues concerning their learning and the teacher. In each case the interview concluded by asking the student to discuss any factors that affected their learning that had not already been covered.

Each interview was different, and students were allowed freedom to discuss whatever they saw as important for their learning. Each student was interviewed alone; the interviews were recorded, interview transcripts typed up by the author, and subsequently analysed with the help of the QSR N6 qualitative analysis package.

## 9.4 APPROACH AND OUTCOME – PERFORMANCE IN EXAMINATION

### 9.4.1 EXAMINATION CONTENT

To determine whether the examinations faced by the two groups of students were consistent with the conceptual framework for management accounting produced in Chapter Eight, an analysis was made of past papers of the ACCA, ICAEW and university based on the topic headings of Table 8-1. Since the majority of examination questions demand practical use of one or more problem-solving techniques, a separate analysis was made of these techniques. As well as the overall number of topics covered, the range of questions under each main topic heading was also important. A skewness analysis was performed to assess the breadth of questions asked by each body.

### 9.4.2 PERFORMANCE IN FORMAL ASSESSMENT

The ACCA's examinations facilitate comparison between approach and performance since there is no form of reassessment after failure or compensation<sup>14</sup>. The university receives results from the ACCA's results reporting system for those students who have completed an examination immediately after the end of their module. The university does not receive marks for students who take the examination later or who retake the examination after failure.

Over a three-year period, marks were received for 81 of the ACCA management accounting students who had completed an ASSIST questionnaire. The examination for the level one paper, numbered 1.2 in the ACCA's system, can also be completed electronically but marks gained in this way were not available to the University. The results were analysed (Chapter Thirteen) to establish any relationship between approach to study and assessment mark or passing and failing the examination.

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<sup>14</sup> University Examination Boards may compensate students who fail in one subject on the basis of good performance elsewhere. At the time of the study students were not penalised by having a reduced mark if they initially failed an examination and then passed it on resitting.

## 9.5 APPROACH AND OUTCOME – DEPTH OF UNDERSTANDING INTERVIEWS

### 9.5.1 INTERVIEW SAMPLE

A second set of interviews was conducted during 2005/2006 with a sample of students studying for the ACCA paper 2.4, Financial Management and Control. The purpose of these interviews was to try to relate the students' approach to learning as measured by ASISST with their performance working on a case study. The paper for which they were studying mainly comprised management accounting but a part of its content incorporated financial management<sup>15</sup> and, being second level, all the students would have studied management accounting before. The first level ACCA qualification is very technique driven, as is the technician qualification, essentially a uni-structural approach. The 2.4 paper is clearly aimed at an expansion of the techniques and has a compulsory first question designed to link a number of techniques in a multi-structural or, potentially, relational approach and so is clearly appropriate for this study

Two groups were involved, the first studying for examinations taken in December 2005 and the second for examinations in June 2006. Some of the students had degrees in accounting; a few had taken paper 1.2, Financial Information for Management, and the remainder one of the accounting technician qualifications, CAT or AAT. All students on each course were offered the opportunity for a one-to-one interview as an aid to their revision immediately before their examination and, at the end of their first interview, invited back for a second interview two or three months later when they might have been expected to have forgotten what they had revised. Eight of the December cohort volunteered, of whom six returned for a second interview; of the second cohort, ten students volunteered, of whom six returned for a second interview. The first case study was presented to the students immediately before their examinations.

### 9.5.2 ANALYSIS OF DEPTH OF LEARNING

Pask's work is associated with the use of '*lengthy experimental learning tasks*' (Entwistle *et al.* 1982; p29) and his methodology was followed in this study through the use of a pair of case studies. The studies were each designed to last about an hour and cover a number of key areas of the management accounting syllabus. To minimise any effects created by the

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<sup>15</sup> Until the syllabus was revised for the December 2007 diet of examinations it was the only second level management accounting paper.

use of two studies, the two were rotated between the two groups of students, the first group got case study one first and two second; for the second group the order was reversed.

Figures 9-1 and 9-3 show the case studies presented to the students and 9-2 and 9-4 map out the various areas of which knowledge was demanded to solve the cases, based on the concept diagrams of Chapter Eight. Each required a breadth of knowledge covering a significant part of the management accounting syllabus.

#### *9.5.2.1 CASE STUDY ONE*

Case Study One (Figure 9-1) was essentially about the difference between fixed and variable costs; Figure 9-2 shows how its content relates to the concept diagrams of Chapter Eight. Students needed to assess the level of variable costs per unit, and fixed costs in total, by comparing costs at two levels of output. It was possible to solve this as an algebraic problem but all the students should have known a simple technique called the high/low method designed to achieve that outcome. Once costs had been ascertained it was possible to produce two forecast profit statements to assess whether the firm would be better off building a new facility or expanding production within the existing one. This is a fairly standard type of short-term decision-making question though more ferreting around was required than would normally be the case. Having established that it was worth building the new facility, students were then invited to work out the benefits to be gained from the change over a three year period using a net present value (NPV) approach. Alongside the two main parts of the question were three minor sections:

- 1) A consultant's report had been produced; this was a sunk cost and should have been ignored.
- 2) Students were invited to consider other means than profit of deciding whether to open a new facility. A break-even approach was being looked for here; although the new factory was more profitable, potentially it might have a higher break-even point so the extra risk might have offset the promise of extra profit.
- 3) The case stated that the company used its management accounting information to prepare its financial accounts. Since marginal costing is not acceptable for financial accounts preparation, the students should have been able to determine that the company used absorption costing to prepare its accounts. They were invited to prepare a relevant part of the absorption cost accounts (the stock valuation).

*You are the financial director of Rex, a car manufacturer and are considering the possibility of a production increase of a new model, the Lente, it was introduced at the start of this year and sells for £10,000. With this in mind £25,000 has been invested in a consultant's report, which has produced the following figures:*

*Production last year was 50,000 Lentes and sales 45,000. Cost of production was £400 million broken down as follows:*

	<b>£m</b>
<i>Direct Materials</i>	75
<i>Direct Labour</i>	50
<i>Machining Costs</i>	75
<i>Power</i>	35
<i>Supervisory Costs</i>	65
<i>All Other Costs</i>	100

*The consultants believe that an increase in profit is possible by reducing the price to £9,500 per car which would result in sales of 75,000 units. They estimate that if production were increased to 100,000 units under existing conditions, cost of production would rise to £600m. However, it is likely that sustained production at levels above 50,000 units would lead to an increase in variable costs of 5% on the original level..*

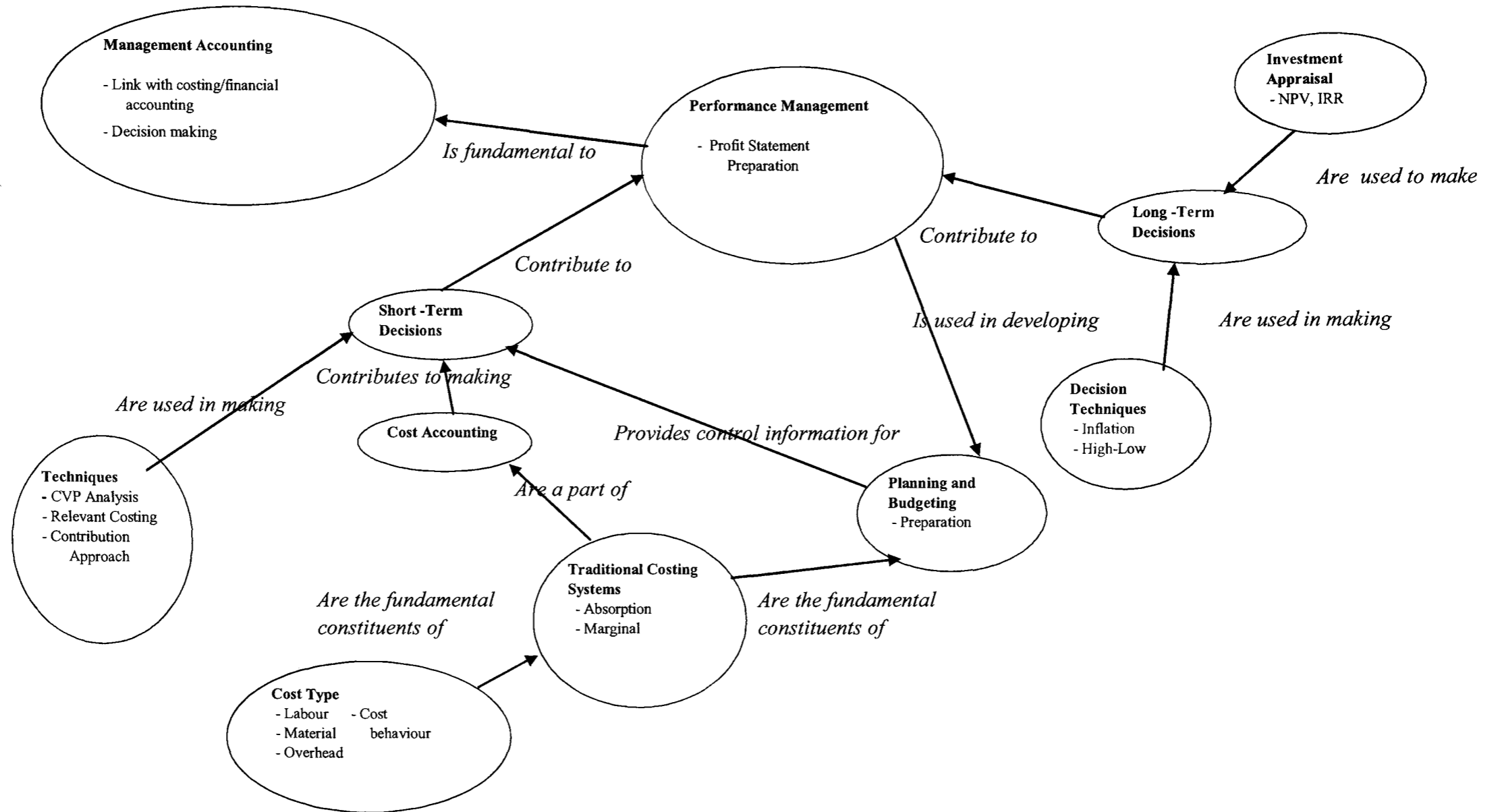
*As an alternative, Rex is considering the possibility of expansion by building a new facility. In this case also the price would still be reduced to £9,500 but the level of production would be expanded to 75,000 units. The new facility would involve additional annual costs of £50 million but improved efficiency would result in all variable costs being reduced by 15% from the original level.*

*Rex uses its management accounting information to prepare its financial accounts.*

*Rex can borrow from its bank at a cost of 9% but overall its cost of capital is 10%. You believe that car prices and sales volumes will remain stable for the next three years but that all costs will rise by 5% a year (NB ignore this information in answering the first part of the question).*

*You are required to analyse the above figures using the techniques available to you and to report appropriately noting any assumptions made and possible weaknesses in the model(s) used.*

**Figure 9-1 – The Text of Case Study One**



**Figure 9-2 – Concept diagram (mind-map) showing the areas of management accounting addressed by the first case study; the areas are based on the ones established in Figure 9 -1**

### 9.5.2.2 CASE STUDY TWO

Case Study Two (Figure 9-3) was fundamentally about forecasting and budgeting; Figure 9-4 shows how its content relates to the concept diagrams of Chapter Eight. Like Case Study One, it covered the difference between fixed and variable costs. This time students had to find the level of variable costs per unit using information derived from a variance analysis. Once the costs had been determined it was possible to produce three forecast profit statements to assess whether the firm would be better off reorganising its production or continuing with its existing practices, though a conclusion could be arrived at more speedily using incremental costing techniques. An NPV analysis was required to find the projected benefits gained by reorganisation over a three-year period.

Alongside the profit computation, cost forecast, and NPV parts of the question the students also had to be able to:

- 1) Choose cost of capital rather than cost of borrowing as a discount rate in the NPV analysis
- 2) Use variance analysis to establish actual cost from given variances.
- 3) Use the expected value technique to establish a single figure from a series of potential cost reductions.

### **Case Study Two**

*Your firm is experiencing problems of declining profit and urgently needs to reduce costs as the volume of sales has remained constant for the last three years.. One proposal for cutting costs involves a reorganisation of the factory over a three-year period. Although the reorganisation itself would be costless, there would be some incidental impact on costs as detailed below.*

*Over the past three years, your sales and profits were as shown below (all figures in £ millions):*

<i>Sales</i>	<i>250.00</i>	<i>262.50</i>	<i>275.63</i>
<i>Costs</i>	<i>175.00</i>	<i>189.00</i>	<i>204.51</i>

*Three years ago, a full-cost audit revealed indirect overheads to total £50 million, since when both they and sales have risen in line with each other. The reorganisation would cause fixed overheads to fall but the exact benefits have yet to be quantified. The best you can achieve is that there may be a reduction of overheads of 20%, but there is a 20% chance it will be 15% or a 30% chance it will be 25%. However you are confident that it will be one of these three values. The reorganisation will cause an increase of direct material usage of 5%; materials, at the date of the full cost audit, represented 40% of direct costs, the rest are direct labour, there are no direct overheads.*

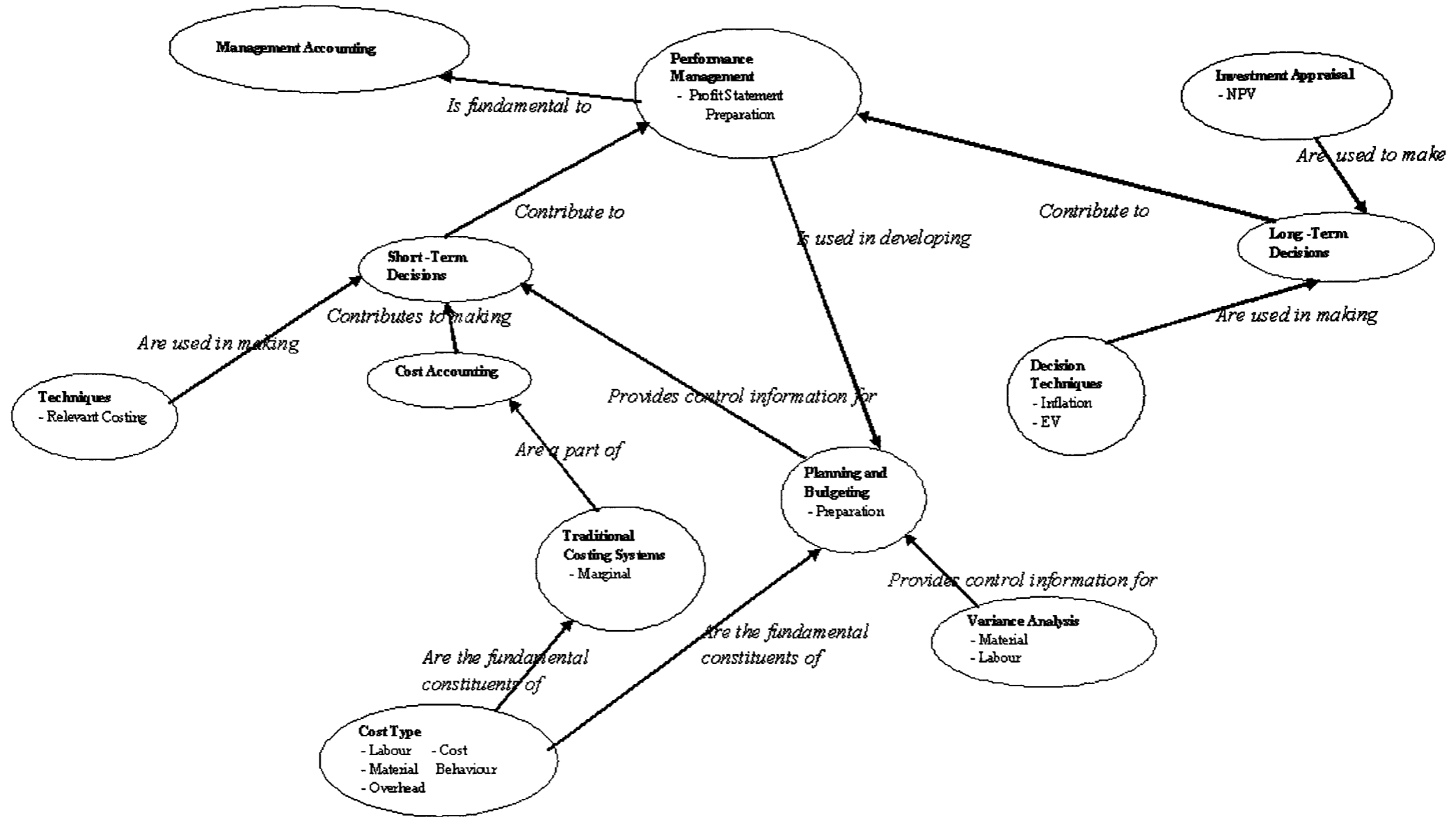
*You have been investigating cost variances in an attempt to find the cause of the cost increases. Over the last three years you have noted the following variances (all figures in £ millions):*

<i>Price variance</i>	<i>0.00</i>	<i>-2.75</i>	<i>-6.20</i>
<i>Quantity variance</i>	<i>0.00</i>	<i>-5.00</i>	<i>-10.5</i>

*Three years ago the standard price of materials was £5 a kilo and the standard quantity used was 10m kilos.*

*Is the reorganisation worthwhile? Ignore taxation in your computation and assume the company's cost of funds is 10%. Does anything else of value emerge from your computation?*

**Figure 9-3 – The Text of Case Study Two**



**Figure 9-4 - Concept diagram (mind-map) showing the areas of management accounting addressed by the second case study; the areas are based on the ones established in Figure 9-3**

Students were invited to read the case and asked to answer the question posed. The interviewer only intervened if the student requested it or appeared to be stuck. The intervention generally took the form, 'What do you think you should do now/next?', or 'How would you ...', or 'What if you..?', and tried to lead the student through the solution. Only if a student was completely stuck and did not know how to proceed at all did the interviewer show the student what to do. Usually this would be in the application of a specific technique such as the high/low method, or variance computation discussed in Chapter Fourteen.

Although this was fundamentally a phenomenographic study in that the students were allowed to construct their own outcome space, the case studies did not allow for a totally constructivist approach but imposed a pre-constructed reality on the students. The students, whatever their background, would have encountered a mechanistic model of management accounting that suggests all problems have a unique answer, which can be accurately calculated using the data given and applying standard management accounting computational techniques to that data. Accordingly, their expectation of the outcome from the cases is highly unlikely to differ from that suggested as an answer. Phenomenographic approaches stress that '*the categories should emerge from comparisons conducted within the data*' (Richardson 1999, p70) whereas presumptions were made in this case of deep and surface approaches to learning.

Each of the case study sessions lasted about an hour and was terminated if the student had not completed the case within that timescale. They were recorded and the transcripts typed up by the author and used to provide the material of Chapter Fourteen.

## **9.6 ETHICAL ISSUES**

The studies were carried out using the Durham University research protocol. For all students interviewed, the nature of the study was explained in full to all students interviewed and they were asked to sign an ethics approval form giving consent to the interview. In all reporting of results, in this dissertation and in conference papers given by the author, neither students nor university names have been revealed and no student could have been individually identified.

An ethical issue would exist if one student benefitted more than another by extra attention given by their tutor as a result of being interviewed. All students were offered the opportunity to be interviewed. This is clearly important since the interview was presented as

an opportunity for extra revision and some care was taken to ensure that all students who wished to be interviewed were able to be accommodated at times which suited them – generally after work in the evening.

The final potential problem is that the researcher was also the teacher for many of the students, though in no case was the researcher also the students' assessor. It is unlikely that this made sufficient difference to affect the results gained or the education of the students.

## **9.7 RESEARCH AND RESEARCHER BIAS ISSUES**

### *Questionnaire*

The biggest potential problem in the study was that not all students studying on the modules involved participated in completing the ASSIST questionnaire. The ACCA students almost all completed the forms, which were handed out and collected in the relatively small classes mostly taught by the author. Questionnaires for the undergraduate students were handed out and collected by a three different lecturers in a variety of classes so it is unlikely that any consistent bias intervened.

### *The Sample*

The university's undergraduate students are unlikely to be typical of students at UK universities. Very many of them originate from outside the UK - as indeed do many of the ACCA students - and the university is one of the lower ranked higher education institutions. However, the ACCA is worldwide body so the general results are strengthened by the lack of a UK focus. There is no reason to suspect these factors would impart any consistent bias to the results.

### *The Interviews*

Selection of the sample of students for the first interview is described above. The small number of students who volunteered for interview leaves little room for bias in their selection, though only those students with enough free time - and sufficient interest in their studies - would have actually volunteered for interview, itself introducing a bias.

The researcher as teacher would have been motivated to enhance the students' learning experience – of which completing the case studies could be considered a part – with a view

to improving their chance of examination success. Any possible bias was reduced by having the students complete one case before the examination and one afterwards. In any event there was no onus on the researcher to aid the students directly; better learning was likely to be achieved by allowing the students to solve problems with minimum guidance.

During both sets of interviews, the students interviewed always appeared to be answering questions objectively and there is no reason to believe this was not the case. They were able to discuss their learning – and the case studies for the second group – without any reference to the interviewer as a teacher. All the students completing the case studies appreciated the extra time with their lecturer. However, the fact that for most of the students the interviewer had also been their teacher remains a possible source of influence within the results.

## **9.8 CONCLUSION**

A variety of methodologies has been used in this study, largely following research trends already existing within the studies of student learning.

The next section contains results from the investigations. Chapter Ten explains in detail the content of the subject management accounting as taught and assessed based on the concept diagrams of Chapter Eight; Chapter Eleven details results found by administering the ASSIST questionnaire and the cluster analysis; Chapter Twelve describes the results of interviews carried out with the smaller sample of the students, Chapter Thirteen a discussion of the relationship between approach and examination success for the ACCA students, and Chapter Fourteen the results of the case study analysis. The last section discusses the conclusions arrived at and proposes further research.

## **SECTION FOUR – RESULTS AND DISCUSSION**

# Chapter 10 - Questionnaire Analysis.

## 10.1 INTRODUCTION

This chapter is concerned with analysing the results obtained by administering the ASSIST questionnaire to the sample of students discussed in section 9.2 above. Section 10.2 provides a factor analysis for the sample, section 10.3 discusses those presage factors to learning that produce significantly different scores on the ASSIST analysis, section 10.4 describes the results of a cluster analysis on the sample, and 10.5 draws some conclusions.

## 10.2 FACTOR ANALYSIS

### 10.2.1 THE SAMPLE

The sample comprised 187 part-time ACCA students and 214 full-time undergraduates, studying at different levels (Table 10-1). There were 169 male students and 198 female ones; 34 students did not indicate their gender on the questionnaire (Table 10-2).

<i>Status</i>	<i>Number</i>	<i>Percent</i>	<i>Level 1</i>	<i>Level 2</i>	<i>Level 3</i>
<i>ACCA</i>	187	46.6	78	96	13
<i>Undergraduate</i>	214	53.4	47	143	24
10.2.2 RESULTS <i>Total</i>	401	100.0			

The results shown below relate to pattern matrices derived from Principal Axis Factor

**Table 10-1 – Composition and Level of Study of Sample of students who completed the ASSIST instrument**

extraction using Oblimin rotation. In every case, Varimax rotation provided a similar pattern to Oblimin. A KMO greater than 0.6 and a significant Bartlett measure suggest that factorability can be assumed; the samples discussed below were all highly significant on both these measures. Eigenvalues greater than unity (Kaiser's criterion) are generally assumed significant. Using this criterion generally produced the expected three factors from the data. Cronbach's alpha for the whole sample was 0.84, for the ACCA students 0.72, and for the undergraduates 0.84. A value above 0.7 – 0.8 is generally regarded as acceptable (Field, 2005). Values for the sub-scales also showed acceptable reliability levels using Cronbach's Alpha.

<i>Gender</i>	<i>Number</i>	<i>Percent</i>
<i>Male</i>	169	42.0
<i>Female</i>	198	49.3
<i>Total</i>	367	91.3
<i>Not Indicated</i>	34	8.7
<b>Total</b>	401	100.0

**Table 10-2 - Gender Breakdown of Sample**

Table 10-3 provides a factor analysis for the whole student sample with the thirteen ASSIST subscales on the left-hand side representing, in order from the top: the first four a deep approach, the next five a strategic approach, and the following four a surface approach to learning. Only variables with a value higher than 0.3 are displayed; the analysis shows the clear, three-factor pattern found in many previous studies. The first factor indicates students having a strong and consistently deep approach to learning; they also place importance on monitoring effectiveness. Students in the second group display a strategic dimension to their learning, being only atypical in that the deep learning group displays the greater interest in monitoring effectiveness. Those in the third group are the surface learners; they are aligned to an approach that lacks purpose, with a strong loading on unrelated memorising. These three factors explain 60% of total variance for the sample of 401 students.

	<b>1</b>	<b>2</b>	<b>3</b>
<i>Seeking Meaning</i>	0.689		
<i>Relating Ideas</i>	0.650		
<i>Use of Evidence</i>	0.806		
<i>Interest in Ideas</i>	0.504		
<i>Organised Studying</i>			0.854
<i>Time Management</i>			0.794
<i>Alertness to Assessment</i>			0.433
<i>Achieving</i>			0.628
<i>Monitoring Effectiveness</i>	0.496		
<i>Lack of Purpose</i>		0.672	
<i>Unrelated Memorising</i>		0.852	
<i>Syllabus Boundedness</i>		0.458	

**Table 10-3 – Factor Analysis of the whole sample of 401 students showing a clear split into three factors corresponding to deep, strategic and surface approaches**

Table 10-4 shows results for the ACCA students alone. Again the three factors emerge; in this case monitoring effectiveness appears as a factor for both the deep and strategic learning groups.

	<b>1</b>	<b>2</b>	<b>3</b>
<i>Seeking Meaning</i>	0.657		
<i>Relating Ideas</i>	0.663		
<i>Use of Evidence</i>	0.732		
<i>Interest in Ideas</i>	0.434		
<i>Organised Studying</i>			0.814
<i>Time Management</i>			0.729
<i>Alertness to Assessment</i>			0.465
<i>Achieving</i>			0.700
<i>Monitoring Effectiveness</i>	0.442		0.336
<i>Lack of Purpose</i>		0.604	
<i>Unrelated Memorising</i>		0.912	
<i>Syllabus Boundedness</i>		0.322	
<i>Fear of Failure</i>		0.522	

**Table 10-4 – Factor Analysis for the ACCA students only, again displaying the deep, strategic, and surface approach factors.**

Table 10-5 provides the same analysis for the undergraduate students. This table indicates a group where the deep and strategic factors merge; only two factors are present: one includes the deep learners, who also have a strong strategic dimension; the other the surface learners. In fact, consistent across the whole sample of ACCA and undergraduate students and evident for males, females, undergraduates and ACCA students alike the deep and strategic scores were highly and significantly correlated at 61.1%\*\* for the whole groups and similar scores (53.0% ACCA, 68.7%\*\* Undergraduate, 61.8% Women, 60.0% Men). Surface/deep, and surface/strategic showed no significant correlation.

	1	2
<i>Seeking Meaning</i>	0.740	
<i>Relating Ideas</i>	0.670	
<i>Use of Evidence</i>	0.717	
<i>Interest in Ideas</i>	0.601	
<i>Organised Studying</i>	0.712	
<i>Time Management</i>	0.749	
<i>Alertness to Assessment</i>	0.681	
<i>Achieving</i>	0.749	
<i>Monitoring Effectiveness</i>	0.722	
<i>Lack of Purpose</i>		0.644
<i>Unrelated Memorising</i>		0.763
<i>Syllabus Boundedness</i>		0.562
<i>Fear of Failure</i>		0.613

**Table 10-5 - Factor Analysis for the undergraduate students, here displaying only two approach factors: deep and surface**

Table 10-6 separates the undergraduate and ACCA students by looking at mean values of the score on each approach scale in turn. The strategic and deep dimension scores are similar but the ACCA students score lower on the surface dimension. Both groups are relatively and significantly deep in approach (mean deep score exceeds mean surface score).

	Surface**	Deep	Strategic
<i>ACCA</i>	11.3	14.7	14.5
<i>Undergraduate</i>	12.7	14.3	14.6

**Table 10-6 - Differences in mean score between the two student groups on the deep, strategic, and surface ASSIST scales**

The overall average scores shown in Table 10.6 are analysed into sub-scale results in Table 10.7. The results shown in Table 10-7 are discussed below.

	<i>ACCA</i>	<i>U'graduate</i>	<i>Difference</i>	
<i>Seeking Meaning</i>	15.372	14.405	0.967	**
<i>Relating Ideas</i>	13.925	14.304	-0.379	
<i>Use of Evidence</i>	15.760	14.750	1.010	**
<i>Interest in Ideas</i>	13.540	13.849	-0.309	
<i>Organised Studying</i>	13.250	13.595	-0.345	
<i>Time Management</i>	13.783	13.657	0.126	
<i>Alertness to Assessment</i>	14.216	15.135	-0.919	**
<i>Achieving</i>	15.110	15.152	-0.042	
<i>Monitoring Effectiveness</i>	16.276	15.546	0.730	**
<i>Lack of Purpose</i>	8.289	10.331	-2.042	**
<i>Unrelated Memorising</i>	10.914	12.346	-1.432	**
<i>Syllabus Boundedness</i>	12.766	13.892	-1.126	**
<i>Fear of Failure</i>	13.237	14.266	-1.029	**
<i>Deep Total</i>	14.649	14.327	0.322	
<i>Strategic Total</i>	14.527	14.617	-0.090	
<i>Surface Total</i>	11.301	12.709	-1.408	**

**Table 10-7 - Differences in mean score between the two student groups on the deep, strategic, and surface ASSIST scales plus thirteen subscales; positive differences reflect higher scores for the ACCA students.**

### 10.2.3 SPECIFIC PROBLEMS WITH THE ASSIST QUESTIONNAIRE

A number of reservations exist relating to use of the ASSIST instrument. These should be discussed before the results can be properly evaluated: ASSIST has been developed largely on the basis of work with first year university students, its relevance for part-time students is unproven, and for professional course students even less certain.

In terms of the instrument's reliability for use with part-time students, some specific questions give rise for concern; these arise particularly in the surface learning area.

Some questions are difficult for these students to answer:

*'I keep an eye open for what lecturers seem to think is important and concentrate on that'* would have no meaning for the ACCA students and

*'I often seem to panic if I get behind with my work'* could be (mis)interpreted as referring to their full-time job interfering with their studies.

*'Often I find myself wondering whether the work I am doing here is really worthwhile.'* does not carry the same message for the part-time student working outside the university as for the full-time undergraduate.

*'I'm not really sure what's important in lectures, so I try to get down all I can.'* has little meaning for students who generally do not have a lecture/seminar pattern to their teaching.

*'I like to be told precisely what to do in essays or other assignments.'* also has little meaning on a course assessed by a single examination.

Especially for the ACCA students, who are generally experienced in the world of education, the questionnaire answers may reflect what they normally do, not their specific response to current learning.

The other problem – which arises for all students – is that it is hardly surprising that a student who gives positive answers to questions like: *'I try to relate ideas I come across to those in other topics or other courses whenever possible'* and *'When I read, I examine the details carefully to see how they fit in with what's being said'* will imagine they are doing well on their course, yet several studies have used student self-assessment as a criterion for judging performance. Questions of this nature begin to raise question marks about whether the students' responses generally convey the precise meaning that academics believe they do.

#### 10.2.4 DISCUSSION OF THE FACTOR ANALYSIS RESULTS

The ASSIST instrument produced a clear, three-factor solution for the whole group and for the ACCA students; the undergraduates have only two factors, deep and strategic sub-scales combining as a single factor. The two groups are not different overall on the deep or strategic dimensions but the undergraduates have a higher surface approach score both overall and on each of the sub-scales. Although not taking a deeper approach overall, the ACCA students do take a deeper approach on two of the sub-scales: 'seeking meaning' and 'use of evidence' The only significant difference on the strategic factor is the 'monitoring

effectiveness' sub-scale where the ACCA students appear significantly better at monitoring their own learning effectiveness.

The ASSIST scores clearly appear to show that undergraduate students do not have a deeper approach to study than their ACCA counterparts, who are often accused of being highly examination focused, but reservations regarding the suitability of the instrument, particularly for use with part-time students, limit the conclusions that can be drawn. If anything it is the ACCA students who show the deeper approach, having significantly higher scores on two of the four 'deep learning' variables (Table 10-7). The ACCA students are better able to monitor their own effectiveness, evidence of better metacognition on their part – a key component of strategically focused learning but in this case appearing with the deep approach factors. The monitoring effectiveness response suggests the concern with assessment often taken as characterising the ACCA student but here also being closely associated with a deep approach to study.

### 10.3 GENDER AND AGE PRESAGE FACTORS

#### 10.3.1 RESULTS

Table 10-8 shows the students' score on each approach by gender - clearly no significant differences exist in the group - and Tables 10-9 and 10-10 repeat the factor analysis separately for male and female students displaying similar results. Although a fourth factor appears for the female students, it is of low significance and only contributes 4.3% to the overall explanatory power.

	<i>Number</i>	<i>Deep</i>	<i>Surface</i>	<i>Strategic</i>
<i>Female</i>	198	14.4	12.0	14.6
<i>Male</i>	169	14.5	12.0	14.5

**Table 10- 8 – Score by gender on the main ASSIST scales for the whole sample**

	1	2	3
<i>Seeking Meaning</i>	0.695		
<i>Relating Ideas</i>	0.693		
<i>Use of Evidence</i>	0.770		
<i>Interest in Ideas</i>	0.560		
<i>Organised Studying</i>			0.860
<i>Time Management</i>			0.918
<i>Alertness to Assessment</i>			0.499
<i>Achieving</i>			0.551
<i>Monitoring Effectiveness</i>	0.399		0.335
<i>Lack of Purpose</i>		0.791	
<i>Unrelated Memorising</i>		0.851	
<i>Syllabus Boundedness</i>		0.429	
<i>Fear of Failure</i>		0.649	

**Table 10- 9 - Factor analysis for male students only, displaying the deep, strategic, and surface approach factors**

	1	2	3	4
<i>Seeking Meaning</i>	0.733			
<i>Relating Ideas</i>	0.565			
<i>Use of Evidence</i>	0.716			
<i>Interest in Ideas</i>	0.318			-0.695
<i>Organised Studying</i>			0.791	
<i>Time Management</i>			0.771	
<i>Alertness to Assessment</i>			0.366	-0.349
<i>Achieving</i>			0.709	
<i>Monitoring Effectiveness</i>	0.487		0.316	
<i>Lack of Purpose</i>		0.689		
<i>Unrelated Memorising</i>		0.816		
<i>Syllabus Boundedness</i>		0.389		
<i>Fear of Failure</i>		0.531		

**Table 10-10 - Factor analysis for female students only, displaying the deep, strategic, and surface approach factors plus a fourth, smaller factor**

A t-test of individual factors between male and female students showed only one significant at the 1% level (no others being significant below the 5% level); it appears that these male students are significantly more concerned about failure.

The next section provides more details of the relationship between gender and age for this sample. Of the two hundred and sixty four students who gave both age and gender, Table 10-11 gives average age and range of ages. A t-test showed no significant difference between the genders though it is possible that some bias could intrude as 137 students did not provide their ages when completing the questionnaire.

	<b>Number</b>	<b>Average</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Std Dev</b>
<i>Female</i>	138	24.7	18	47	5.8
<i>Male</i>	126	25.1	18	56	6.4
<i>Overall</i>	264	24.9	18	56	6.1

**Table 10-11 - Age and Gender for Students Providing Relevant Details**

Table 10-12 gives the correlation between age and approach to learning split by gender; as expected older learners are less likely to be surface learners and more likely to be deep. All students were more likely to be surface learners if younger and deep learners if older but the difference was most significant on the deep learning scale amongst male students

	<b>Deep</b>	<b>Surface</b>	<b>Strategic</b>	<b>Number</b>
<i>Female</i>	9.2	-10.6	11.8	138
<i>Male</i>	25.8**	-13.9	7.0	126
<i>Total</i>	17.7**	-13.1*	9.3	264

**Table 10-12 – Correlation between score on each approach to learning factor from the ASSIST questionnaire and age, split by gender**

Table 10-13 reveals the source of the correlation between age and approach. Older, male undergraduate are likely to be deeper learners. The ACCA students, being on average older, do not display the same effect. Undergraduates of both sexes become more strategic learners with age; the lack of any such relationship amongst the ACCA students masks this effect in the sample as a whole.

		Deep	Surface	Strategic	Number
<b>Female</b>	<i>ACCA</i>	1.7	3.7	4.0	56
	<i>Undergraduate</i>	19.8	11.7	30.9**	82
<b>Male</b>	<i>ACCA</i>	16.3	15.4	-3.3	48
	<i>Undergraduate</i>	43.5**	-14.8	27.8*	78
<b>Total</b>	<i>ACCA</i>	11.0	10.8	0.01	105
	<i>Undergraduate</i>	30.4**	-1.5	28.6**	163
<b>Total</b>		17.7**	-13.1*	9.3	268

**Table 10-13 – Correlation between score on each approach to learning factor from the ASSIST questionnaire and age, split by gender and type of student**

### 10.3.2 DISCUSSION OF GENDER AND AGE RESULTS

Two conclusions can be reached from the results shown above:

Older male undergraduates are likely to score more highly on the deep approach scale. This specific effect has not been previously noted in the literature but the fact that gender differences have been observed in previous studies may be due in part to an age effect. Table 10-14 shows the effect more clearly. The average deep score for the whole sample was 14.5; younger male undergraduates - i.e. below the mean age - have a deep score lower than that for the ACCA students (13.81 vs.14.68), the older undergraduates a higher one (15.52 vs 14.63). This effect was much more marked – though in the same direction – for males than for females. Thus, one source of difference between the ACCA students and their undergraduate counterparts is that they are older and therefore more likely to take a deeper approach to their learning as measured by ASSIST; even though overall the two groups did not differ on the deep factor score the ACCA students emerged with a deeper score on two of the subscales.

Undergraduates of both sexes take a more strategic approach as they get older. This is due to age alone and not level of study; the strategic scores for first, second and third year undergraduates were 14.5, 14.7, and 14.3. As with the deep factor, there was no overall difference between the groups but, since the average age of the undergraduates was 22.4 – relatively old for undergraduates – a more typical undergraduate group might well have a lower strategic score than that of the ACCA students.

		<b>Number</b>	<b>Mean Age</b>	<b>Below Mean</b>	<b>Above Mean</b>
<i>ACCA</i>	<i>Female</i>	56	28.0	14.27	14.11
	<i>Male</i>	48	29.6	14.68	14.63
	<i>Total</i>	104	28.8	14.44	14.38
<i>Undergrad.</i>	<i>Female</i>	82	22.5	14.12	14.46
	<i>Male</i>	78	22.3	13.81	15.52
	<i>Total</i>	160	22.4	13.97	14.97

**Table 10-14 – Scores on the ASSIST questionnaire deep scale by gender and type of student showing younger (older) male undergraduates score lower (higher) than their ACCA counterparts**

## 10.4 CLUSTER ANALYSIS

### 10.4.1 CLUSTER ANALYSIS RESULTS

The above analysis reveals few substantive differences between the two student groups under consideration but it is possible that differences exist and are being averaged away. Such differences could be revealed by a cluster analysis to identify specific combinations of students. The data were first forced into an eighteen cluster solution and Table 10-15 below shows the results for the seven largest clusters totalling 247 students and accounting for 61% of the whole sample.. The ‘Sex’ column scores females as “1” and males as “2”, so a score greater than 1.5 is predominantly male; similarly the ‘ACCA/Underg.’ column scores the ACCA students as “1” and undergraduates as “2”.

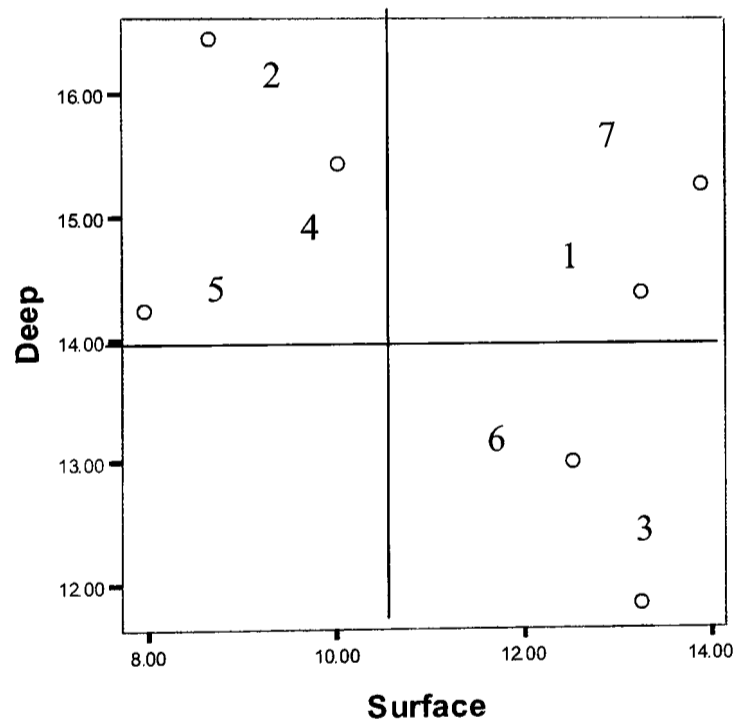
Cluster 1 contains the most male students (54%) and has a high surface and low strategic orientation; cluster 2 the deeper students, with a low surface orientation, mostly (69%) ACCA and (52%) male, the second highest percentage; cluster 3 has young students with a low deep, surface, and strategic orientation; cluster 4 is mainly older – and ACCA – students with a deep orientation; cluster 5 is mainly women (65%) with a low surface orientation; cluster 6 is mostly undergraduate (67%) and has a low deep orientation; and cluster 7 are young, undergraduate (78%) and female (67%) with a high surface orientation.

In general these results confirm those above: the deeper students tend to be older; high surface approaches can be found in students of all ages and both sexes. Viewing the results on a graph comparing deep and surface approaches - Graph 10-1 - the clusters divide the

students approximately equally between three quadrants. The strategic dimension added little to the graph, at least partly because of the correlation between deep and strategic scores.

Cluster	Deep	Surface	Strategic	Age	Sex	ACCA	Number Underg.
1	14.37	13.24	11.55	25.2	1.54	1.52	29
2	16.44	8.65	16.92	28.1	1.52	1.31	29
3	11.82	13.24	12.56	22.8	1.37	1.52	33
4	15.43	10.02	13.07	28.1	1.42	1.16	31
5	14.23	7.957	14.87	23.8	1.35	1.41	29
6	12.98	12.52	14.29	24.9	1.50	1.67	46
7	15.26	13.90	15.36	23.2	1.33	1.78	50

**Table 10-15 – Sample of 401 students analysed into eighteen clusters. The Table shows characteristics of the seven largest clusters totalling 247 students**



**Graph 10-1 – The seven clusters shown in Table 10-15 graphed by deep/surface score**

To the top right – high deep and surface (factors emerging from the factor analysis are assumed orthogonal) – are two groups:

- younger, largely female (67%) undergraduates (78%), with a high surface score (Group 7);
- largely male (54%) older students from both groups with a high surface and low strategic orientation (Group 1).

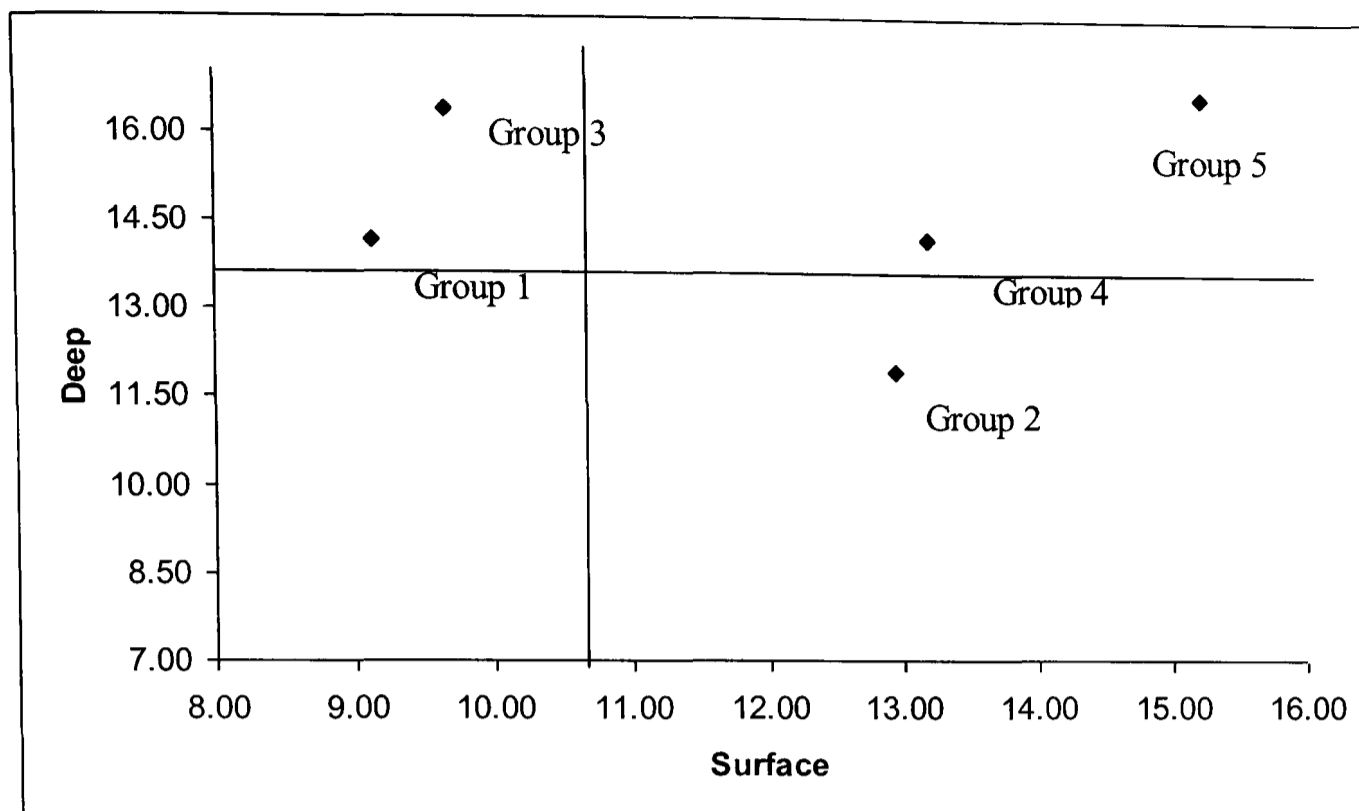
To the bottom right of the graph – high surface and low deep – are a second group of slightly older undergraduate women and the youngest group of both sexes.

- mainly undergraduates (67%) (Group 6);
- younger students (Group 3).

The third set – high deep and low surface – is of three groups:

- older, students (Group 4);
- older, mainly ACCA students (Group 2);
- largely female (65%) ACCA students (Group 5).

Establishing the presence of clusters is essentially an arbitrary process, so the stability of these clusters was checked by forcing a six cluster solution on the data. Eliminating one cluster composed of only of two individuals, the other five are distributed as shown in Graph 10-2:



**Graph 10-2 – If the group of 401 students is forced into five clusters, a similar deep/surface pattern emerges to that shown in Graph 11-1**

- Group 1 from Graph 10-1 above – disappears when forced into six clusters;
- Groups 2 and 4 from Graph 10-1 – combine into a single group, 1;
- Groups 3 and 6 from Graph 10-1 – combine into a single group 2;
- Group 5 from Graph 10-1 – remains as group 3;
- Group 7 from Graph 10-1 – remains as group 4.

In the six group solution, a final group (5) appears, composed mainly of undergraduates of medium age and with both high surface and high deep approaches to learning.

#### 10.4.2 DISCUSSION OF CLUSTER ANALYSIS RESULTS

AS the cluster analysis shows a reasonable degree of stability some tentative conclusions can be drawn:

- Whilst logic might suggest that deep and surface approaches to learning should be inversely related, theoretically the factors emerging from a factor analysis should be independent. Cluster analysis confirms that there exist groups of students who score highly on both deep and surface approach scales. One group comprised largely younger, female, undergraduate students on both graphs, the other of different composition on the two graphs. They may be seeking a relational understanding of their subject but their performance is compromised by an approach that is unlikely to achieve the required degree of understanding.

- No group appears to have both a low surface and low deep approach; these students would not be inclined to rote learn but would not have the motivation to deep learn.
- The ‘model’ students (high deep and low surface) tend to be older, female, and ACCA.
- Conversely the high surface and low deep students tend to be younger undergraduates.
- Although the cluster analysis reveals some differences between ACCA students and undergraduates, all clusters contained individuals from both courses and the impression continues of similarity rather than difference between the groups.

### **10.5 CONCLUSIONS**

Analysis of the ASSIST data and the cluster analysis both showed a fundamental similarity, though a few notable differences, between the ACCA students and the undergraduates. The undergraduates overall and on all the sub-scales had a more surface approach as measured by ASSIST and, on two of the sub-scales, a less deep one. Although the undergraduates were younger an age /surface correlation did not reveal any differences between the groups. The older male undergraduates were likely to have a deeper approach score than their younger counterparts and all undergraduates developed a higher strategic score as they got older. There is an implication that had the undergraduates been more typical of undergraduates generally in terms of age (i.e. younger) their approach scores would have been even less deep and less strategic, which would have made for more marked differences between the undergraduates and ACCA students in terms of the depth of their learning.

# Chapter 11 - Interview Analysis of First Interview Group

## 11.1 INTRODUCTION

If the SAL framework is correct, any differences between the two groups of students concerned is likely to be caused by different presage factors, which affect the students' view of the learning context and therefore their approach to learning. One purpose of interviewing the students was to try to identify any presage factors that differ significantly between the two groups. In the case of some specific presage factors – for example conceptions about learning - the literature suggests a direct association between the factor and approach to learning that would enable a degree of triangulation of the ASSIST results. Where possible these have been commented on during the analysis.

The nature of the interviewees is discussed in section 11.2. Those presage areas susceptible to a quantitative analysis are found in section 11.3. The section following, 11.4, relates to areas where discussions were held with the students: 11.4.1 deals with those areas where the two groups were similar in nature and 11.4.2 the areas where there were clear differences between the student groups. Section 11.5 identifies one final contextual presage area that emerged as of importance - the relationship between management accounting as a subject and the students' understanding of deep learning; section 11.6 provides a summary and conclusions.

## 11.2 CHARACTERISTICS OF THE SAMPLE

The interviewees were equally drawn from the two student groups under consideration (Table 11-1). As in the larger sample discussed in the previous chapter (Table 10-14), the ACCA students were a little older than the undergraduates but with a similar range of ages. As Table 11.1 demonstrates and Table 11.2 amplifies, the sample of interviewees showed a wide diversity of backgrounds, only a little more than half had received all their education in the UK. As such they may be atypical of UK university students generally. Approximately half the ACCA students interviewed possessed degrees; the two undergraduates with degrees were from Pakistan and Bangladesh where degrees are normally not counted as of equivalent level to those in the West. The country split reflects the university's normal student intake.

The range of countries concerned was wide and overlapping but the ACCA students were more focused towards the New Commonwealth (South Africa and New Zealand) and Europe (Lithuania), whereas the undergraduates were largely drawn from other parts of Africa and the Indian sub-continent. The overseas total includes one undergraduate born in the UK but educated in Pakistan.

	Total	Graduate	UK	Overseas	Mean	Age	
						Min	Max
<i>ACCA</i>	15	8	7	8	28.4	21	39
<i>Undergraduate</i>	15	2	7	8	23.5	18	34

**Table 11-1 - Age and Origin of the Interview Sample**

<i>Country of Origin</i>	<b>Undergraduates</b>	<b>ACCA</b>	<b>Total</b>
UK	7	7	14
New Zealand		1	1
Africa			
South Africa		2	2
Other	3	1	4
Indian Sub-Continent	3	1	4
Lithuania		2	2
Croatia		1	1
Taiwan	1		1
Kuwait	1		1
<b>Total</b>	<b>15</b>	<b>15</b>	<b>30</b>

**Table 11-2 - Country of Origin of the Interviewees**

Three undergraduates had previously attended a UK University, one had successfully completed the first year of an accounting degree elsewhere and moved into the second year at the university, the second had started a computer science degree elsewhere and decided to change subject so had entered the first year at the university. The third had completed four(!) years elsewhere - three of mathematics and one of computing and mathematics before entering the first year of a the accounting degree.

Of the undergraduates who did not attend another university, only two came straight from school to university, a third had a period at a college in between; three took a year out to travel and the rest were mature students who had had a period at work before entering tertiary education, the average age of the undergraduates was five years below that of the ACCA students.

Male students predominated in the sample (Table 11-3), there was no reason for this other than the actual students willing to volunteer for interview. The students were more or less equally drawn from the three levels of study.

It is important that the sample of students chosen for interview reflects the nature of the

	<b>Level</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>
<i>ACCA</i>	1	5	3	2
	2	6	3	3
	3	4	2	2
<i>Undergraduate</i>	1	6	6	
	2	5	4	1
	3	4	3	1
<b>Total</b>		<b>30</b>	<b>21</b>	<b>9</b>

**Table 11-3 - Characteristics of the interviewees, showing gender and level of study**

wider sample for any valid conclusions to be drawn about differences between the two groups of students under consideration. It is evident from Table 11-4 that in terms of approaches to learning, age, and the split between ACCA and undergraduate students, the learning characteristics of the interviewees are consistent with those of the sample as a whole, except for the surface dimension where the surface factor score is lower for the interview sample than for the larger sample of students. The students who volunteered for interview appear to take a greater interest in their own learning and accordingly are less likely to have a surface approach to learning. However, it is also clear that they do not score higher on the deeper approach scale than the rest of their cohort.

			<i>Mean</i>	<i>Standard Deviation</i>
<b>Deep</b>	<i>Sample</i>	30	14.40	2.36
	<i>Group</i>	401	14.48	2.26
<b>Surface</b>	<i>Sample</i>	30	10.74	2.12
	<i>Group</i>	401	12.05	2.62
<b>Strategic</b>	<i>Sample</i>	30	14.42	2.29
	<i>Group</i>	401	14.58	2.36
<b>Age</b>	<i>Sample</i>	30	25.8	5.52
	<i>Group</i>	267	24.9	6.06

**Table 11-4 – Comparison between approach to learning scores from the ASSIST questionnaire and age of the interviewees - the whole sample displayed great similarity to the larger group other than on surface score**

### 11.3 QUANTITATIVE ANALYSIS

This section describes those presage factors where some degree of quantitative analysis of the results was possible; section 11.3.1 deals with factors relating to the student and 11.3.2 factors relating to the learning context.

#### 11.3.1 THE STUDENT

Student based presage factors include: metacognition, conceptions about the nature of learning, and about the purpose of learning, all of which - according to the 3-Ps model - will affect the students' learning either directly, or indirectly by changing their approach to learning. The next three sections present the findings and section 11.3.1.4 discusses the results.

11.3.1.1 METACOGNITION

Metacognition – the ‘*cognition of cognition*’ (Flavell, 1979) – implies having an understanding of one’s own approach to learning. During the interviews the students were asked to rate their own approach to learning. The words ‘deep’, ‘surface’, and ‘strategic’ were explained to the students in general terms but each probably already had his or her own interpretation, certainly none asked in more detail about their meaning. Any analysis where these terms are used therefore reflects the students’ own interpretation. Table 11-5 provides an analysis of the responses.

Own View	Type	Deep	Surface	Strategic		Average Deep	Average Surface	Average Strategic
Deep	ACCA	13.5	8.8	14.2	}			
Deep	ACCA	14.3	7.8	15.2	}			
Deep	ACCA	15.3	9.8	14.0	}	14.9	8.8	13.8
Deep	ACCA	16.8	9.0	11.6	}			
Deep	UG	8.0	13.0	9.4	}			
Deep	UG	11.3	11.3	13.2	}			
Deep	UG	13.4	8.6	14.6	}			
Deep	UG	14.5	9.0	16.8	}			
Deep	UG	15.5	14.8	10.6	}	13.9	10.3	13.8
Deep	UG	15.5	8.8	15.4	}			
Deep	UG	16.0	6.8	14.0	}			
Deep	UG	17.0	10.0	16.2	}			
<b>Average</b>						14.2	9.8	13.8
Surface		11.3	13.3	10.6		11.3	13.3	10.6
Strategic	ACCA	14.3	12.3	11.0	}			
Strategic	ACCA	15.6	10.9	14.4	}			
Strategic	ACCA	16.3	13.5	17.2	}	16.3	12.2	14.8
Strategic	ACCA	19.0	12.0	16.6	}			
Strategic	UG	13.8	11.5	13.8	}	14.8	10.6	15
Strategic	UG	15.8	9.8	16.2	}			
<b>Average</b>						15.8	11.7	14.9
<b>Overall Average</b>						14.6	10.6	13.9
<b>Average of Sample of 401 Students</b>						14.5	12.1	14.6

Table 11-5 – Metacognition: deep, surface, and strategic approach scores for individual students who described themselves as deep, surface, or strategic learners. The final three columns give averages for the ACCA, undergraduate, and all students

The top section comprises the group of twelve students who described themselves as deep learners. The top four are the ACCA students, whose average deep score is higher than that for the sample and for the whole population of 401 students. The next eight, undergraduate students, have a lower deep score than the group and sample average. Only the one - ACCA – student in the centre of the Table, in line with his ASSIST approach score, thought of himself as a surface student. The final group of six students who responded about their approach said they used more than one approach and were classified as having a strategic orientation. Although the average score for both undergraduates and ACCA students was above that of the whole sample and whole population, for both groups that represented one student above average and one below.

The table suggests little correlation between ASSIST derived approaches to learning and the students' own views about themselves.

#### *11.3.1.2 CONCEPTIONS OF LEARNING*

Taking the five conceptions of learning developed by Säljö and discussed in section 3.2.1 above, the students were shown the possible conceptions of learning and invited to offer a definition of learning on the scale of increasing conceptual complexity shown in Table 11-6, where the number of students giving each response is shown (only 22 of the students provided a usable comment). The scale is translated into nine points to allow for students who wanted to span two definitions. Comparing the two groups, the ACCA students have a more consistent view of knowledge, but that view is a relatively instrumental one. By comparison, the undergraduates are spread evenly across the scale in terms of their perception of the definition of learning.

	Scale	Total	ACCA	Undergraduate
<i>Increase of knowledge</i>	1	2	1	1
	2	1	0	1
<i>Memorising</i>	3	2	0	2
	4	3	3	0
<i>Acquisition of facts, procedures</i>	5	7	6	1
	6	2	1	1
<i>Abstraction of meaning</i>	7	3	2	1
	8	1	0	1
<i>Interpretation aimed at understanding reality</i>	9	1	0	1
<i>Total</i>		22	13	9
<i>Weighted Average</i>			4.85	4.89
<i>Standard Deviation</i>			2.1	0.4

**Table 11-6 – Students’ views on the definition of learning split between ACCA, undergraduate and total on a nine point scale ranging from the highly instrumental ‘increase in knowledge’ to the conceptual ‘interpretation aimed at understanding reality’**

It has usually been assumed that the first three categories of Säljö’s conceptions of learning scale (section 3.2.4) constitute a quantitative view of learning and the remaining two a qualitative one; a qualitative view being seen as leading to a deeper understanding. For this sample, 66% (nine out of twelve or 75% of the ACCA students who answered the question and five out of nine or 56% of the undergraduates) saw learning as a quantitative activity.

Relating definition of learning to the approach scores measured by ASSIST (Table 11-7) shows no relationship between students’ views on the definition of learning as compared with their ASSIST scores on the deep scale. On the surface scale undergraduate students with a qualitative view of learning (scale categories 6-9) had a lower score than both the ACCA students and their counterparts with a quantitative view of learning (scale categories 1-5).

Scale	— ACCA —			— UG —			— Total —		
	Number	Deep	Surface	Number	Deep	Surface	Number	Deep	Surface
				1	17.00	10.00	1	17.00	10.00
				1	13.75	10.50	1	13.75	10.50
				2	14.56	9.19	2	14.56	9.19
	3	14.58	7.75				3	14.58	7.75
	6	14.75	11.54	1	15.50	14.75	7	14.86	12.00
A	9	14.69	10.28	5	15.08	10.73	14	14.83	10.44
	1	12.50	13.25	1	14.50	9.00	2	13.50	11.13
	2	15.25	11.13	1	16.00	6.75	3	15.50	9.67
8				1	14.50	7.75	1	14.50	7.75
9				1	11.25	11.25	1	11.25	11.25
Total/Average	3	14.33	11.83	4	14.06	8.69	7	14.18	10.04

**Table 11-7 – Students’ views about the definition of learning: showing the average deep and surface approach scores of those students nominating each purpose of learning. The sub-totals relate to qualitative and quantitative views of learning (see above)**

### 11.3.1.3 PURPOSE OF LEARNING

The students were asked their view of the purpose of learning; the responses of those who answered are shown in Table 11-8. The three options shown were suggested to the student; two undergraduates also mentioned ‘making me a better human being’ and one student in each group saw it as a way of helping them in the future.

	To learn about the real world of business		To pass exams for future career		To learn the subject for itself	
	ACCA	Undergrad.	ACCA	Undergrad.	ACCA	Undergrad.
<i>Number of Mentions</i>	4	4	10	7	2	1
<i>Deep Score</i>	13.56	18.44	14.20	15.55	14.75	13.38
<i>Surface Score</i>	11.38	12.65	10.83	12.21	7.75	8.63

**Table 11-8 – Students’ views about the purpose of learning: the Table shows the number of times each was mentioned, several students selected more than one purpose**

The only purpose any student suggested on its own was 'To pass exams for future career' this was usually suggested in common with one of the other two purposes. The table indicates how many times each purpose was mentioned in total. The average deep and surface approach scores of the students selecting each purpose are also shown. The Table does not reveal any significant differences between the student groups but the numbers involved in each category are very small.

#### 11.3.1.4 DISCUSSION OF THE QUANTITATIVE STUDENT PRESAGE FACTORS

These quantitative presage factors allow a degree of triangulation with the ASSIST based approach scores. Individual comments on each of the three areas are made in the discussions below.

##### *Metacognition*

Half of both groups of students describing themselves as having a 'deep' approach were at or below average for the group and two of the undergraduates describing themselves as 'deep' had the lowest deep scores of the group. Only one student described himself as a surface learner though two other students had higher surface scores. The average deep score of the group describing themselves as strategic was higher than that of the group describing themselves as deep. It appears that ASSIST scores do not relate closely to the students conceptions of their own approaches to learning.

Although the differences in approach scores between the ACCA and undergraduate groups in Table 11-5 are not statistically significant, there is a suggestion that the ACCA students, with greater experience of learning and of life, display better metacognition in the sense of being more aware of their own approach to learning – or at least what is measured as such by the ASSIST questionnaire. The average deep score of those ACCA students who thought of themselves as deep was higher than the average and higher than that of the undergraduates. Similarly, the surface score of the 'deep' group was lower than the average and that of the undergraduates, though of course there is no necessary relationship between deep and surface approaches.

This is in a sense tautologous; students who respond that, for example, they '*usually set out to understand for myself the meaning of what we have to learn*' (question 4 on the questionnaire) are highly likely to believe themselves deep learners. So this result only describes either the relationship between their general beliefs about their learning and how

they answered the questionnaire, or their beliefs about their own learning compared with that of other students. Thus a student may answer ‘*agree somewhat*’ to the above question, but describe themselves as a deep learner because they had forgotten how they answered the questionnaire – or genuinely felt differently at that time – or believed, as compared with other students, that ‘*agree somewhat*’ represents being an individual who is a deep learner.

### *Conceptions of Learning*

Lord and Robertson (2006) investigated accounting students’ conceptions of learning although, unlike this group who were shown possible answers, they derived the categorisation from open-ended responses to the question ‘*What is learning for you?*’ on a questionnaire. They found that 63% of their students had a quantitative conception of learning and quoted an average figure of 56% from a sample of six other studies. On average the two groups of students under consideration here had a very similar average view of the definition of learning though variation was much greater for the undergraduates and the sample very small.

Leveson (1994) concluded:

*‘it could be hypothesised that conceptions of learning in accounting that centre on knowledge acquisition and technique are more likely to be associated with surface learning approaches and inferior outcomes compared to conceptions where learning is viewed as a search for meaning’.* (p532).

Table 11-7 indicates that, if the ASSIST scores are meaningful, this view does not apply here. Students who saw learning as quantitative scored more highly on the deep approach, and also scored more highly on the surface approach. In neither case was the difference statistically significant. There is a difference between undergraduates and ACCA students on the surface scale, the former with a qualitative view of learning scoring lower but the numbers involved are very small.

### *Purpose of Learning*

Table 11-8 indicates the very strong career orientation of both groups but tempered on the part of some by a desire to learn about the ‘*real world*’ of business. These results tie closely with those of Lucas (2001) most of whose students selected a similar category ‘*passing the subject*’. Lucas saw these students as taking a surface approach as opposed to the ones looking at the subject more generally and whose approach was to try to relate their

accounting learning to other aspects of their education. However, the picture here is more complex, many students combine a desire to pass the examination with a broader interest in their studies. These students are older than those of Lucas, whose sample came straight from school to university and were therefore younger and less experienced than the ones from this sample. There is no significant relationship in Table 11-8 between approach score and purpose of learning.

Further discussion with the students also suggested very similar motivations between the two groups '*It is about passing exams for future career*' from an ACCA student and '*I suppose I am doing it for a future career*' from an undergraduate were typical of the responses from the group as a whole.

The findings in these three areas strongly suggest that it would be wrong to place too much reliance on the ASSIST approach scores unsupported by further evidence.

### 11.3.2 THE TEACHER

The second set of presage factors incorporates those having an effect on the learning context; prime amongst these is the role of the teacher. The next three sections present the results followed by a discussion in section 11.3.2.4.

#### 11.3.2.1 TYPE OF TEACHING AND APPROACH

Following Nowak and Gowin (1984), students were asked how they saw the teacher's role along a scale from '*reception learning*' (information delivery) through '*guided discovery learning*' to '*autonomous discovery learning*'. Allowing a five-point scale for students who chose a point between the three options, the results are shown in Table 11-9. ACCA students showed a clear preference towards the teacher as information deliverer, whilst the undergraduate students were aligned more towards the teacher who would look to develop them as individuals.

	Scale	Total	ACCA	Undergraduate
<i>Reception</i>	<i>1</i>	7	4	3
	<i>2</i>	6	6	
<i>Guided Discovery</i>	<i>3</i>	9	4	5
	<i>4</i>	2		2
<i>Autonomous Discovery</i>	<i>5</i>	4	1	3
<i>Other</i>		2		2
<i>Total</i>		30	15	15

**Table 11-9 – The students’ expectations of the type of learning to be delivered by the teacher on a five point scale between reception and autonomous discovery learning split between ACCA and undergraduate students**

Table 11-10 compares approach as measured by ASSIST and expectation about the type of learning to be delivered; although the correlations were in the expected direction (deeper learners looking for autonomous discovery learning and surface learners for reception learning) neither of the correlations was significant.

Expectation	Number	Deep	Surface
<i>I=Reception</i>			
<i>1</i>	7	13.8	11.0
<i>2</i>	6	13.9	12.2
<i>3</i>	9	13.8	9.9
<i>4</i>	2	15.0	8.9
<i>5</i>	4	16.1	11.8
<i>Other</i>	2	17.1	12.1
<i>Total/Average</i>	30	14.4	10.8

**Table 11-10 – The students’ expectations of the type of learning to be delivered by the teacher, on a five point scale between reception and autonomous discovery learning against average approach to learning scores**

### 11.3.2.2 DEPTH OF LEARNING AND APPROACH

A similar question asked students to rate the depth of their current learning along the Nowak and Gowin scale from rote to meaningful learning. Table 11-11 presents the results. These are much less clear with no evident distinction between ACCA and undergraduate students.

	Scale	Total	ACCA	Undergraduate
<i>Rote Learning</i>	1	2	1	1
	2	2	1	1
	3	8	5	3
	4	4	3	1
<i>Meaningful Learning</i>	5	3	1	2
<i>More than one</i>		4	2	2
<i>Other</i>		7	2	5
<i>Total</i>		30	15	15

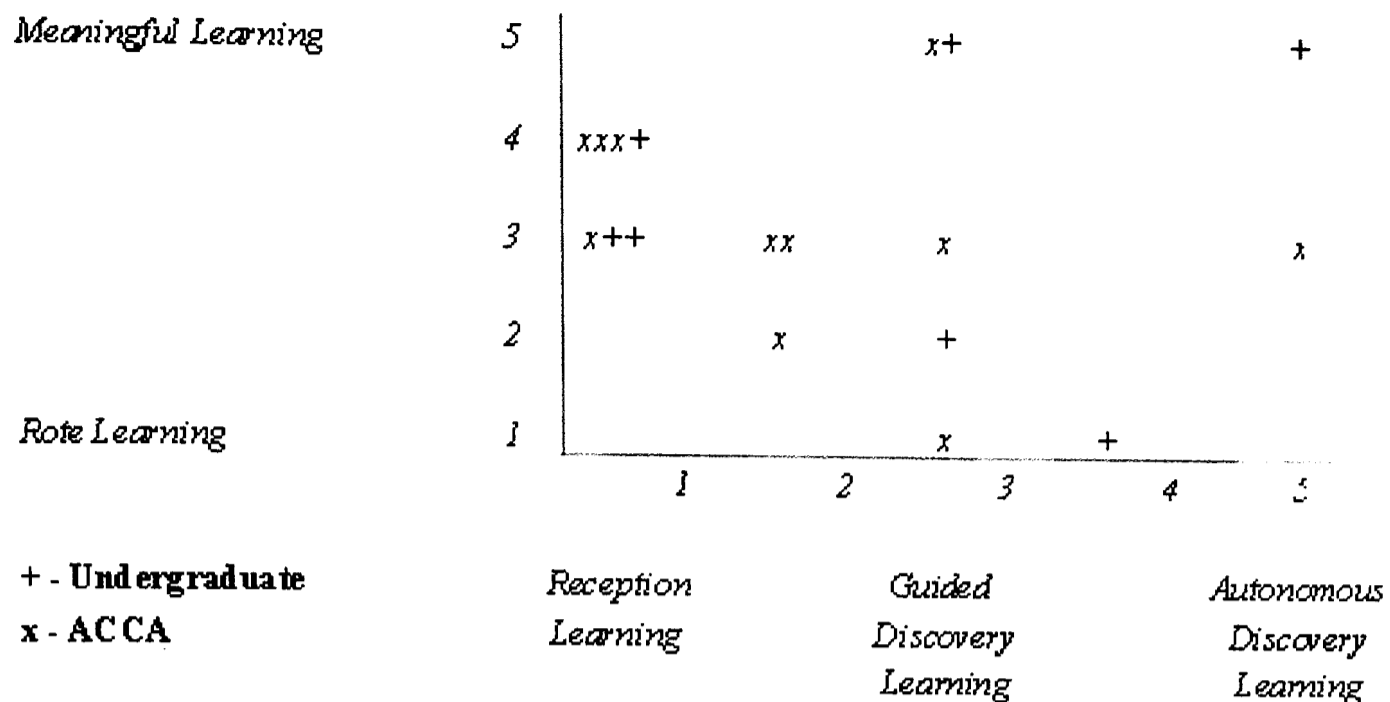
**Table 11-11 – Students’ beliefs about the depth of their current learning by type of student shown on a five-point scale between rote and meaningful learning**

Table 11-12 indicates the deep /surface split of the results shown in Table 12-11. There was a 49% negative correlation between the deep scale and belief about depth of learning, significant at the 5% level - rote learners tended towards a deeper approach.

Belief	Number	Deep	Surface
<i>1=Rote</i>			
	1	2	17.3
	2	2	10.4
	3	8	14.9
	4	4	10.0
	5	3	14.4
<i>Other</i>	4	14.3	11.9
		12.6	12.5
<i>Total/Average</i>	23	14.1	10.7
		14.4	11.0

**Table 11-12 – Students’ deep and surface approach scores classified by belief about the depth of their current learning shown on a five-point scale between rote and meaningful learning**

Graph 11-1 plots responses to the depth of learning question against those for the type of learning. There is a small tendency for the ACCA students to perceive their learning as deeper than the undergraduates and the preferred teaching style to be more towards information delivery; however the numbers involved are very small and any relationship not at all strong.

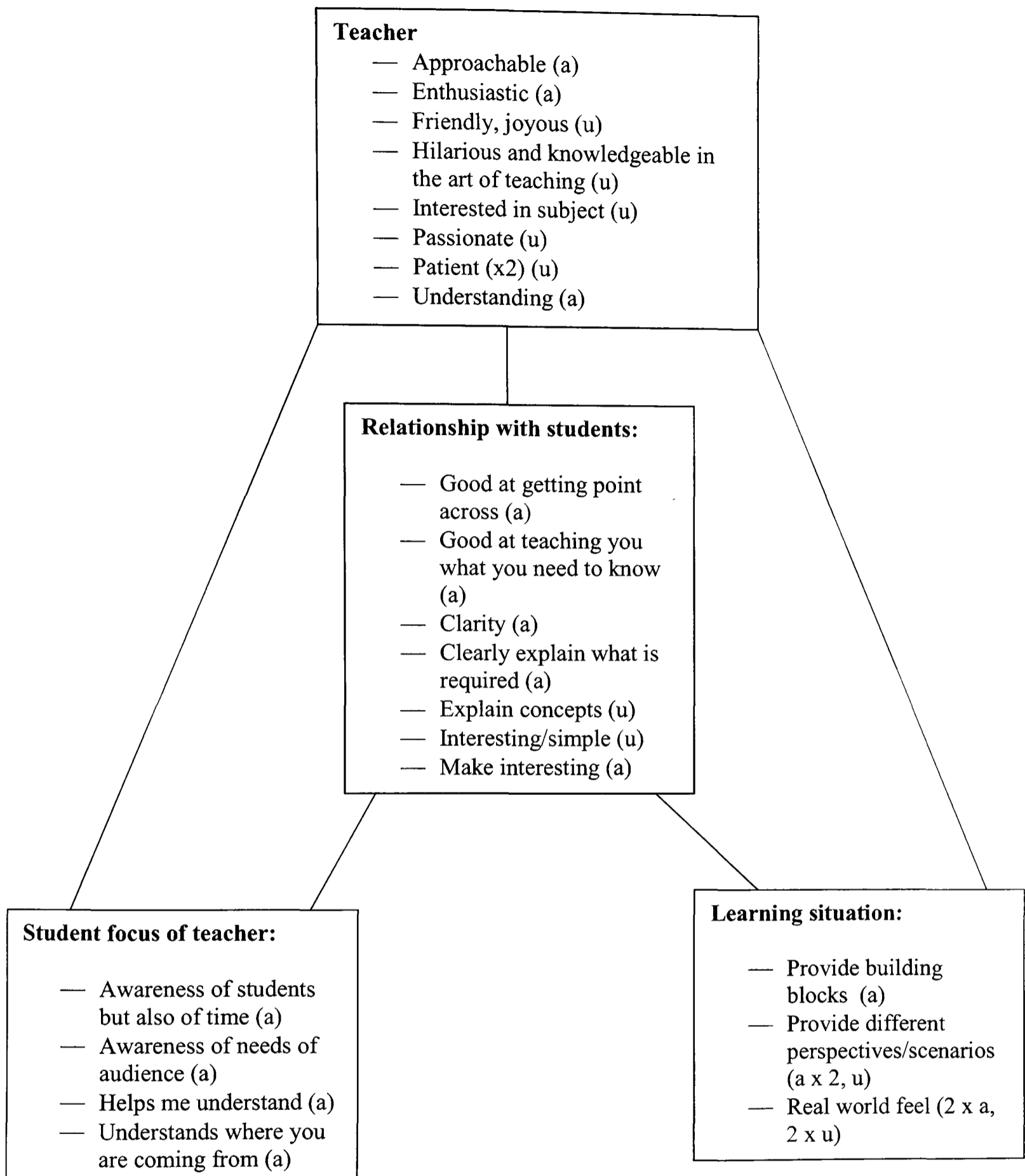


**Graph 11-1 – Graph showing students’ views of depth compared with views of type of learning**

*11.3.2.3 SINGLE BEST FACTOR OF TEACHER*

Interviewees were asked for the single factor most desirable in a teacher (Hativa and Birenbaum, 2000). The responses were remarkable in their variety, but can be broadly divided into those related to the teacher and teaching, those related to the student, and those related to the subject and teaching situation (Figure 11-1). A fourth category, which combines elements of two or more of the others, sits between the three. The ‘a’ or ‘u’ in brackets following each quality denotes ACCA or undergraduate student. The two types of student have similar requirements of the teacher, the only exception being the three undergraduates who looked for a ‘real world’ feel to the teaching - logical enough if they are the ones without much experience of the world of work.

The desirable personal characteristics of the teacher may be summed up as being approachable, fun, and keen on her subject. Understanding the student’s needs and requirements forms a second group of qualities focusing on the student rather than the teacher. The teacher should add a sense of perspective to her teaching by providing extra dimensions to the subject, a ‘real world’ quality, and break it down into manageable components. Sitting between these three groups are a requirement to be simple and interesting.



**Figure 11-1 - Students' views about the most important characteristics displayed by the teacher: 'a' shows ACCA, and 'u' undergraduate students**

#### 11.3.2.4 DISCUSSION OF TEACHING CONTEXT FACTORS

Only in terms of type of teaching were any differences noted between the groups in this part of the study. The ACCA students showed a preference for the teacher as information deliverer as compared with the undergraduate group but there was no real difference between the groups in terms of the perceived depth of their learning.

Accepting the concerns surrounding the ASSIST scores, the fact that rote learners apparently tended to a deeper approach to their learning may indicate that accounting is a subject where rote learning is not unambiguously associated with a surface approach:

*While surface approaches to learning can be associated with mechanical rote learning, memorization through repetition can be used to deepen and develop understanding and help achieve good academic performance.’ (Cooper, 2004; p306)*

Though with such a small sample it would be wise not to draw too many conclusions.

On the desirable attributes of the teacher, there was little difference between the groups but there was a tripartite focus on the qualities of the teacher *per se*, on those qualities that showed understanding of student needs, and those reflecting on the relation between teacher and subject. A fourth category contained elements of the other three.

Measuring the presage factors discussed above revealed few meaningful differences between the two student groups and none that persuasively suggest an explanation for their very different performance. As in section 11.3.1, in neither beliefs about depth or type of teaching was there any evidence that triangulated with the ASSIST scores. The only significant relationship – with rote learning and the surface approach – was not in the direction that would be expected *a priori*.

The next section goes more fully into those areas discussed with the students during their interviews to examine the remaining presage factors.

## 11.4 THE OTHER PRESAGE FACTORS

For the most part discussion with the students about the remaining presage factors revealed few differences between the groups. The next section, 11.4.1, briefly touches on those factors where no evidence of differences between the groups emerged; the areas where differences were observed are discussed in section 11.4.2.

### 11.4.1 PRESAGE FACTORS WHERE THE GROUPS WERE SIMILAR

On the student based factors, discussion about their education, reason for choosing accounting, and mathematical ability revealed no obvious differences between the two groups.

Many in both groups had been educated overseas and more of the ACCA students were already graduates. The latter fact – together with their age and experience profile – is likely to contribute to a deeper approach by the ACCA students.

The whole sample provided a striking unanimity as to why its members chose accounting as a career - regardless of the type of student involved. Five elements predominated jointly or severally: a facility for mathematics and/or the subject itself, an initial job in the field, a recognition of the potential job prospects, a family connection, and, possibly at least in part as a result of the other factors, a genuine liking of the subject

By far the majority of interviewees (12 out of 14 who commented) perceived a positive relationship between accounting study and mathematics, that being good at mathematics helped in learning accounting. Previous studies have noted a mixed relationship between mathematical ability and accounting. The results reported here do not concur with that mixed experience. Two of the undergraduates had already studied mathematics at University and found accounting more to their taste.

The context based factors were dominated by the teacher; for the most part that discussion is referred to in section 11.3.2 above.

Taking the totality of the responses, no significant differences were evident between those of the ACCA and undergraduate students in terms of the teacher and teaching. The quote

below illuminates the point about why students prefer at least an element of information delivery by their teachers:

*'The worst lecturers that I have come across are the ones that try and get interaction out of their students before they have taught them what it is they are supposed to know'*

The quote, from a post-graduate student close to completing his ACCA qualification, captures the dilemma of all teachers, how to engage the students' interest, and maintain that engagement, before they have any underpinning factual knowledge. It echoes Kirschner *et al.* (2006, p80) who stressed the lack of evidence for the effectiveness of unsupported learning. The alternative, to lose the students' interest by delivering a series of facts, is equally unwelcome. The same student referred to the teacher who provided insufficient information as like someone who takes you to a crossroads only to provide information about the route after you had already taken the turn.

The other learning context factors are: interest, type of assessment, workload, and choice:

Time and again the same message came across from both groups of students – interest in the subject made them learn deeply, lack of interest led to a surface or, at best, strategic approach.

One comment by an ACCA student gives the clue to why these students are not the surface learners they are often accused of being:

*'It's your career so you have to have a feeling for it or change your career'*

From evidence of the interviews, the effect of the type of assessment on student learning depends very much on student preference. The majority of students were happy with examinations - *'I don't really do much until the examinations anyway'* (a) - though a degree of coursework was also seen as positive by some. The ACCA students only have examination-based assessment but showed no enthusiasm for a degree of coursework. Their lack of time would be a likely contributory factor to this preference. The students as a whole did not express a preference for one mode of assessment or the other so this was not a factor differentiating between the groups.

Students from both groups expressed themselves as satisfied with the amount of choice on their course.

## 11.4.2 PRSESAGE FACTORS WHERE DIFFERENCE S WERE OBSERVED

In three areas: work experience, assessment, and workload, differences emerged between the groups. These are examined in more detail below with a discussion in section 11.4.2.4.

### 11.4.2.1 WORK EXPERIENCE

Current work experience is clearly greater for the ACCA students. Previous studies have only taken into account prior work experience as a presage factor. The key difference here is between ACCA and undergraduate students the former of whom are working, many in an accounting environment, so having the ability to relate their studies to their current work situation.

*'obviously if I can relate it to my working environment then often it tends to make it more easy to understand' (a)*

ACCA students were able to reinforce their studies at work, so work forms both a part of the background and of the current learning context. Nearly all the ACCA students had at least some ability to do this - of the fifteen interviewed only two were working in a non-financial environment - few of the undergraduates were able to relate their learning to work outside the university. But the undergraduates were by no means neophytes. Most had some work experience prior to attending University or had part-time jobs and many had also experience of accounting as a subject as part of another course.

The usefulness of work experience was questioned by one ACCA student:

*'Oh, it was frightening the people that - I spent a year in practice and kind of knew what these things were - the people that were straight out of A-levels were thrown into management accounting, it was just a random set of mathematical problems that were being put in front of them ..... It's frightening. It intrigues me. I'd love to know what the other people in my class do in terms of like work and their day to day things. Because it's - you know the final three levels are quite - relatively difficult especially given the fact that you are at work.'*

Suggesting that many students were unable fully to relate the material learned in class with their work environment.

#### 11.4.2.2 TEACHER AS ASSESSOR

The most important difference between the ACCA and undergraduate students was that, for the undergraduates, the teacher was responsible for setting the assessment. Several of the undergraduates commented on this:

*'I had an exam today and it was a piece of cake [laughs] The teacher gave us five or six topics, fair enough, and all of them were there. All you have to do is just use your brain and just y'know'*

As an ACCA student with a degree pithily commented:

*'You don't want to set questions you haven't taught because obviously that makes you look stupid'.*

By concentrating on a more limited range of questions and focusing their attention, lecturers can actively encourage their students to work on the most important topic areas.

*'At university the person who is teaching you does know what is going to be in the paper because they are setting it. They can steer you in a certain direction whereas the teachers and the lecturers for ACCA don't, it is more pot luck so you have to cover a much broader - you can't really focus on certain areas' (a)*

The ACCA students perceived themselves as disadvantaged.

*'It is more pot luck so you have to cover a much broader [field]. You can't really focus on certain area .. What I found about the degree that was quite nice was the choice of subjects that you had'*

One student also saw the different examination arrangements for ACCA students as significant:

*'I went to my exams I couldn't believe it there were two thousand people crammed into a hall and it is very intimidating and you have your little table and chair and there are people everywhere it is a bit scary.....you are examined by an external body, it just feels more serious when it's done by them' (a)*

Whereas the university students sat examinations in a less intimidating environment with which they were already familiar.

#### 11.4.2.3 WORKLOAD

Workload was not an important issue for the undergraduates, even though several of them worked outside the university, but was for some of the ACCA students. Some felt strongly on the issue:

*'It is a ridiculous amount. I mean what you can learn - they need to think more practically. How can you possibly?'* (a)

However, some students were not so unhappy with the workload:

*'I wouldn't necessarily call it stressful. It's time consuming. I don't believe they put anything in there that is rocket science but they put enough in there that if you don't know what you are doing you will fail. And if you have a bit of common sense and a few tools and give it a good stab you have a 50/50 chance'* (a)

Or even saw it as positive:

*'I think it is a good pressure...it's getting me motivated to get something done. If I wasn't doing this I don't think I would be doing anything.'* (a)

There was a clear relationship between the time available and the depth that could be attained:

*'Not [deep learn] as much as I would like. There just isn't the time. .... it is just impossible. There is so much to cover. How could you possibly learn that?'* (a)

In general the undergraduates were happy with the amount of time available to spend studying at university<sup>16</sup>. The ACCA students did not want to spend more time studying at the university, because of the time available to them rather than the time they felt was needed for study.

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<sup>16</sup> Undergraduate modules have thirty taught hours plus six revision hours; ACCA classes comprise fifteen sessions of three hours.

#### *11.4.2.4 DISCUSSION OF CONTEXT FACTORS WHERE DIFFERENCES WERE OBSERVED*

Of those factors where differences are evident between the groups, the ability to relate the course to their work should enable ACCA students to perform better than the undergraduates and, by making their studies appear more relevant, tend to make their approach to learning deeper. The lecturer setting the undergraduates' examination should improve their performance; the effect on their approach - if any - is unclear. The extra workload suffered by the ACCA students is likely to reduce their performance and give them a tendency to a more surface approach.

The approaches framework is silent on the size of any effect caused by the various presage factors so - with the usual reservation about the meaning of the ASSIST scales - all that can be concluded is that:

- the work experience factor does not cause the ACCA students to perform better than the undergraduates, though their performance might be worse without it, and it may go some way to helping their apparently somewhat deeper approach;
- the assessment issue was likely to have been crucial to the undergraduates' performance;
- workload may be a cause of the ACCA students' poor performance but it does not cause their approach to be a surface one as compared with the undergraduates.

One final presage factor affecting the context of learning - the nature of the subject being taught - emerged from the interviews. Both groups made similar comments in this area. The final section of this chapter deals with the relationship between management accounting and other subjects

### **11.5 MANAGEMENT ACCOUNTING AND DEEP LEARNING**

#### **11.5.1 INTRODUCTION**

So far in this dissertation the definitions of deep and surface have been assumed to be synonymous with those given in section 4.2 but there is no particular reason why students when discussing these or related issues have the same understanding as academics (c.f. Haggis's criticism of assumptions about the meaning of 'meaning' in section 6.3.1.5). Part of their understanding about deep learning emerged from discussion during the interviews concerning the relationship between accounting and other subjects. The content of this discussion is summarised below.

### 11.5.2 MANAGEMENT ACCOUNTING AND DEEP LEARNING—DISCUSSION

Several students pointed out that they approached different subjects in different ways. Subjects needing practice were seen as particularly needing a deep approach, conversely, subjects relying in a knowledge of theory, which can simply be regurgitated for an exam, can be surface learned; depth here is perceived as ‘able to do’ not ‘able to relate’. Clearly this says more about the students’ understanding of the meaning of deep learning than about the difference between the subjects:

*‘I have to deep learn if I am doing a calculation or something I need to deep learn because I need to deep learn, how to get through it I need to understand all the steps but for something like auditing I was something like a surface learner’ (a)*

Management accounting as taught is relatively light on theory and is perceived by the students as being technique driven. Other subjects rely more heavily on theory. The students interviewed spoke with a single voice - they preferred accounting because it is calculation based. The key here is the mechanistic model of management accounting; for both groups of students there was no doubt that accounting was an attractive subject because of its focus on practical computation as opposed to theory:

*‘With me the reason I go in depth in reading these days is that I’ve never liked the theoretical side of it and you know accountants like to number crunch. I love number crunching and computational work.’ (u)*

On being asked whether the practice implied deeper learning the latter student agreed that was the case.

*‘Accounting subjects have got less theoretical part of it. It’s about understanding the concepts so you have got more mathematical calculations part of it so I think that makes it a lot easier’ (u)*

Getting it right is a matter of practice rather than exploration of conceptual relationships:

*‘I think learning accounting is a lot of practice. I’m not sure about the financial accounting but in management accounting you need to do a lot of practice’ (u)*

The implication being that rote learning through practice will lead to a deeper understanding.

The role of the teacher also reflects the link between theory and practice. An ACCA student asked when she felt she needed the support of a teacher:

*'Well when you need practice like examples and stuff at least you would want to know what examples and for theory you can just memorise.'*

It is clear that 'theory' is seen as something to be learned and regurgitated, not a complex set of inter-connections. So does practice lead to theory?

*'Yes. It is only then that you will get it. You can't learn it from a text. You have to physically do it to find if I do this, this will happen or if I change this, this will happen'*  
(a).

When these students answer the ASSIST questions, particularly those contributing to the 'syllabus-boundedness' sub-scale, such as *'I tend to read very little beyond what is actually required to pass'*, a student with a genuinely deep approach would understand that depth was arrived at by practice and not by wider reading. It is very likely that such students would perform well on assessment, which largely demands mechanistic solutions to management accounting problems.

## **11.6 CONCLUSIONS**

This chapter's more detailed examination of the student presage factors confirms the similarity of the two student groups under consideration. In terms of context factors, only one distinguishes clearly between the groups, the fact that undergraduates sit examinations set by their teachers. The content of the examinations form the next chapter of this dissertation.

Although the randomness of the groups' selection was limited by the individuals volunteering, the similarity suggests at least that those students of both types who volunteered did not differ greatly in terms of the majority of presage factors.

Although there is some evidence of accountants tending to be surface learners, the evidence is by no means conclusive and the concept of rote learning as a precursor to deep understanding may be an important factor for both groups of students.

Having examined presage factors and approach, and following the next chapter on examination questions, the rest of this study concentrates on the product of learning. Chapter 13 looks at performance in formal assessment of the ACCA students and Chapter 14 examines performance against the benchmark established in Chapter 8.

# Chapter 12 – What Is Being Taught?

## 12.1 INTRODUCTION

This chapter builds on the concept diagrams of Chapter Eight to establish what is currently being examined - and therefore taught - by the ACCA, and the university under consideration. As in Chapter Eight, results from the ICAEW have been included as a comparison to ensure that neither of the other two organisations are out of line with the mainstream approach. Section 12.2 examines the actual subjects examined, section 12.3 the spread of questions asked, and section 12.4 the practical techniques of which the students are expected to have knowledge. Section 12.5 comments on the need for pragmatism in assessment and section 12.6 concludes and summarises the chapter.

## 12.2 MANAGEMENT ACCOUNTING AS ASSESSED

Using the topic headings from Table 8-1, Table 12-1 shows the percentage breakdown of topics between the three organisations as asked in examination questions. As established in Chapter Eight, there has been little change in the subject's scope almost since its inception so an attempt was made to cover as great an historical period as possible:

The ICAEW has a complete historical record of syllabi and examinations – from it three sample periods were selected as examples: 1959-1963, 1979-1983, and 1999-2004.

The ACCA has a complete past record of examinations extending back to 1999; a sample (about 50%) of examinations was available back to 1991

The university is poorly served by its records, only about half the examinations set dating back to 1995 were available

The Table represents a summary of all the questions asked by the bodies during these periods; the results are illustrated graphically in Graph 12-1. Appendix 4 shows a breakdown for each organisation by level together with associated graphs.

Although the topic areas covered are fairly similar for the three bodies – as would be expected from the similarities in their syllabi established in Chapter Eight – there are some important differences. The two professional bodies display very similar patterns across the board with the key focus being on what might be considered the fundamental areas of

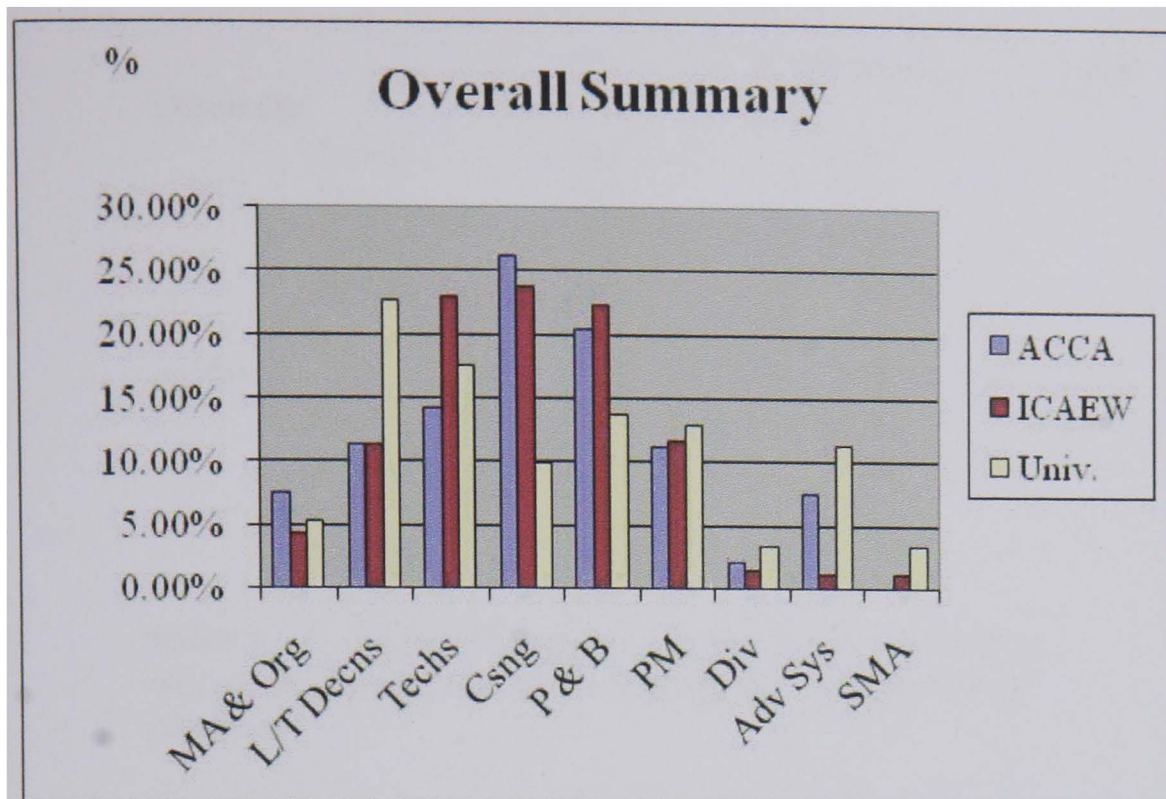
costing and planning and budgeting. The university shows two clear differences from the other two: their questions are concentrated more towards the advanced areas of strategy, advanced systems and techniques, divisionalisation, and performance management, which suggests a desire to address topics of a relatively advanced nature. It also focuses more heavily on techniques of long-term investment appraisal – the tables in Appendix 4 reveal that almost a quarter of the questions asked in the first two years of the undergraduate course dealt with long-term decision making. No organisation focuses heavily on the areas of management and the organisation.

	<b>ACCA</b>	<b>ICAEW</b>	<b>Univ.</b>
MA and the Organisation	7.45%	4.26%	5.23%
Long Term Decisions	11.27%	11.35%	22.59%
Techniques	14.18%	23.05%	17.63%
Costing	26.18%	23.76%	9.92%
Planning and Budgeting	20.36%	22.34%	13.77%
Performance Management	11.09%	11.70%	12.95%
Divisionalisation	2.00%	1.42%	3.31%
Advanced Systems	7.45%	1.06%	11.29%
Strategic Management Accounting	0.00%	1.06%	3.31%
	100.00%	100.00%	100.00%

**Table 12-1 – Based on the topic headings listed in Table 8-1 the percentage of questions asked in each category are by listed examination body**

The tables in Appendix 4 also reveal that all three bodies show a pattern of focusing on the basics at level one and then moving increasingly to the more complex areas of performance management and advanced systems. This pattern is very clear for the ACCA and less so for the other two bodies.

Although Table 12-1 reveals some differences between the bodies, it does not indicate the spread of questions within each major topic area. This matter is dealt with in the next section.



**Graph 12-1 – A graphical illustration of the information listed in Table 12-1, showing a comparison of examination topics by institution**

### 12.3 SPREAD OF QUESTIONS

Table 12-2, and the associated graphs found in Appendix 5, show the spread of questions between ACCA and the university. These relate to the topics covered out of the whole hundred and fifty areas (the base number was 144 - No. in the Table - but seven more areas were unique to the ACCA making a total of 151). Most topics will not be examined, zero is always the highest frequency; in first year examinations the university had no questions in 111 areas and the ACCA no questions in 70 areas.

In the first and third years (levels) and overall the university demonstrates a significantly greater degree of skewness. Here is likely to be a key source of difference between the student groups. Although overall the university and professional bodies cover similar topic and practical areas, the ACCA asks questions on a much wider range of topics, the university is skewed towards the left, i.e. zero questions; there is a much narrower range of questions because most topics are not examined. The level/year two figure is something of a statistical aberration – there are fewer year two questions for the university and the questions tend to be concentrated on NPV analysis, which distorts the skewness statistic.

University	No.	Skewness	Std
<i>Year 1</i>	144	3.93	
<i>Year 2</i>	144	2.05	
<i>Year 3</i>	144	4.11	
<i>TOTAL</i>	144	1.85	
<b>ACCA</b>			
<i>Year 1</i>	151	2.60	
<i>Year 2</i>	151	2.64	
<i>Year 3</i>	151	2.23	
<i>TOTAL</i>	151	2.39	

**Table 12-2 – Skewness statistics for the university and the ACCA, illustrating the ACCA’s generally wider spread of questions**

#### **12.4 THE PRACTICAL TECHNIQUES**

A sizeable majority of questions dealing with a given topic area would ask the students to carry out some practical operation using the data provided. Thus a question about costing might ask students to: calculate costs, analyse costs, draw a graph of costs, or calculate costs from an equation - or an equation from costs - and so on. Almost every paper studied was a mixture of theory and practice, the norm being about a third theory – sometimes in a separate section.

A parallel analysis to that on the topic areas was carried out into the practical techniques of management accounting for the ACCA and the university across the same range of examination papers from which the question topic areas were collected. These practical techniques are shown in Table 12-3.

In some areas, the practical techniques precisely match the topic areas noted in Table 8-1. Those techniques relating to costs, revenues, and profits, demand knowledge of how costs change with output in order to calculate both costs and, by subtracting from revenues, profits. Some techniques are specific to a single topic area, for example book-keeping, or to a group of topic areas, for example variance computation. Other techniques use general mathematical knowledge, such as use of equations or regression analysis, that can be employed in a variety of situations. There is considerable overlap between categories, many techniques cross boundaries. In particular calculating budgets uses skills from several of the other areas.

The theory generally meant displaying knowledge about using a particular technique or about applying that technique within the specific confines of the question, the practice about solving a problem using that technique. Typical 'theory' verbs were: 'explain', 'discuss', 'suggest', 'advise', 'define', 'comment' and so on. The problem is that these verbs could imply a uni-structural, multi-structural, or relational level depending on the context. However, it is clear – echoing the students' views expressed in section 11.5 - that theory is seen as an extension of the mechanistic techniques, not a development from them, and that for most questions the theory section was about the technique the student had just employed – implying uni-structurality.

Table 12-4 and Graph 12-2 compare the use of these practical techniques by the university and the ACCA. As with the topic areas, the practical techniques show a similar pattern of usage and again the techniques do not suggest a significant difference between the two bodies, though the university is focused more towards long-term decision making techniques.

## **12.5 ASSESSMENT PROCEDURES**

One final factor is important, the need for efficient assessment procedures. Half of the ACCA level one paper is multiple choice and computer marked; individuals paid on a per script basis mark the remaining papers. Thus there is need for close monitoring and the complex paraphernalia of quality assurance. The process of turning around many thousands of scripts and publishing results is achieved in around two months. The University has to process hundreds rather than thousands of scripts but the turnaround time is much shorter and scripts must be first and second marked and then externally examined before grades are finally awarded at an Examination Board. Setting questions that test the subtlety of a student's understanding and require the marker to make sophisticated judgements is unlikely to be preferred to setting straightforward questions with a numerical answer that is either right or wrong. It would be naïve to believe that at least some questions are not set with the ease of marking in mind. If most questions have specific, numeric answers, it is hardly surprising that students take a world-view that assumes all answers to accounting questions take such a format. For these reasons, questions tend to a uni-structural format, asking about a single, specific topic. Clearly a question demanding a uni-structural answer is unlikely to provide evidence of multi-structurality, let alone of a relational understanding, in the student's performance.

**Long-Term Appraisal Techniques**

**Calculation of Costs/Revenues/Profits**

*Costs*

*General*

*Marginal*

*Absorption*

*Job/Batch*

*Contract*

*ABC*

*Profits/Cashflows*

**Calculate Ratios**

**Calculate Break-Even Point**

**Budgeting**

**Decision Making Techniques**

**Compute Variances**

**Analyse**

**Calculate Transfer Price**

**Book-keeping**

**Draw Graph**

**Use Equations**

**Index/Use Indices**

**Regression**

**Linear programming**

**Other**

**Table 12-3 – *A list of the practical techniques examined by the ACCA and the university***

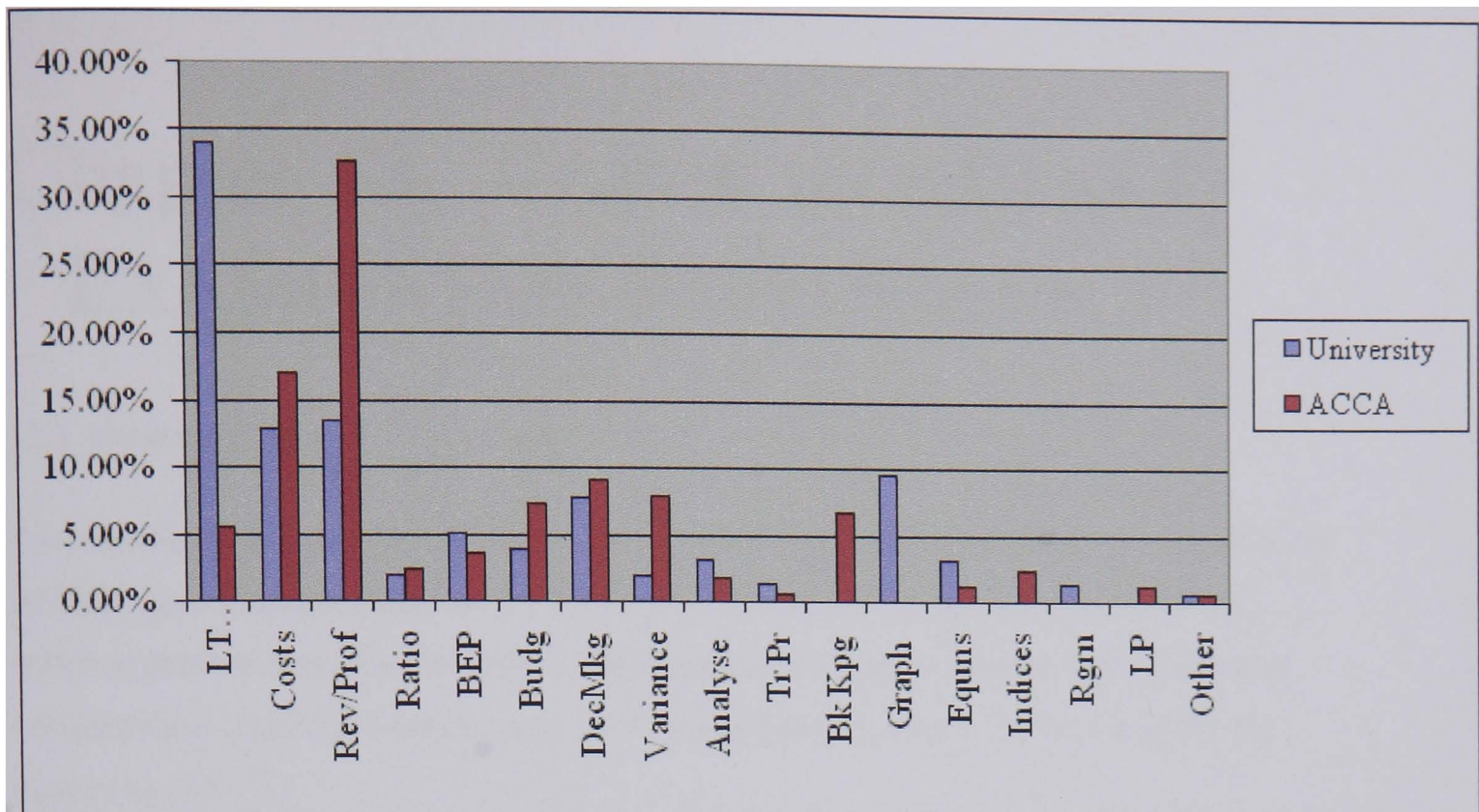
	<b>University</b>	<b>ACCA</b>
Long Term Appraisal	33.97%	5.45%
Costs	12.82%	16.97%
Revenues Profits	13.46%	32.73%
Ratio Computation	1.92%	2.42%
Break Even Points	5.13%	3.64%
Budgeting	3.85%	7.27%
Decision Making	7.69%	9.09%
Variance Analysis	1.92%	7.88%
Analysis Generally	3.21%	1.82%
Transfer Pricing	1.28%	0.61%
Book Keeping	0.00%	6.67%
Use of Graphs	9.62%	0.00%
Use of Equations	3.21%	1.21%
Use of Indices	0.00%	2.42%
Regression	1.28%	0.00%
Linear Programming	0.00%	1.21%
Other	0.64%	0.61%
	100.00%	100.00%

**Table 12-4 – The percentage breakdown of questions on practical techniques from Table 12 -3, listed by institution**

## **12.6 SUMMARY AND CONCLUSIONS**

This chapter established what areas of the syllabus were consistently examined by the relevant bodies. It also considered the practical techniques of which the students were expected to have knowledge.

The main difference between the university and ACCA arose in the variety of question areas covered. Although the syllabi of the two organisations covered almost identical topics and although - as indicated in Table 12-1 – the main topic areas were covered approximately equally, the more detailed picture revealed a different story. The university examined many fewer detailed topic areas, with the implication that university examinations would be much easier to predict than those of the ACCA. So, although the two bodies are in general agreement about the range of topic areas covered by the subject, assessment of that range tends to be more complete for the ACCA students



**Graph 12-2 - A graphical illustration of the information listed in Table 12- 4, showing a comparison of the practical techniques by institution**

In terms of other potential differences between the two groups of students:

- The ACCA had a very clear approach of building up from basic skills at level one to greater complexity at level two and, though not a direct concern here, to depth and a strategic approach for those who take the level three option subject.
- The university had a bias towards what the lecturers considered a depth of vision appropriate for the accounting graduate. The advanced techniques appear even at level one. But the skewness statistics suggest the range of in-depth knowledge and understanding is much smaller for these students. .

# Chapter 13 – APPROACHES AND EXAMINATION PERFORMANCE

## 13.1 INTRODUCTION

Examination marks were available for eighty-one of the ACCA students who completed the ASSIST questionnaire; thirty six of these students were successful, a pass rate of 44%, which is about average for the subject. The students were approximately equally divided between the 1.2 and 2.4 examinations; the 1.2 pass rate was exactly 50%; that of the 2.4 paper only 34%<sup>17</sup>.

## 13.2 RESULTS IN FORMAL ASSESSMENT OF THE ACCA STUDENTS

Since passing or failing the examination is more important than the mark received, the key comparison is between approach to learning and passing/failing. Table 13-1 compares the mean mark and deep, surface, and strategic scores of passing and failing students. The significance levels of the results show that only the surface score is significantly related to the probability of passing the examination. The table suggests students having a more surface approach are likely to fail their exam; those with a less surface – but no deeper – approach are likely to pass.

When the results were broken down between the two papers, correlation was much higher between the paper 2.4 mark and surface score (-49%\*\* ) than paper 1.2 (-20%) but for both

	<b>Passing Group</b>	<b>Failing Group</b>
<i>Mark</i>	63	35
<i>Deep</i>	14.8	14.7
<i>Surface**</i>	10.3	12.2
<i>Strategic</i>	14.3	14.5

**Table 13-1 – Comparison between students who passed their ACCA examination and those who failed in terms of average mark and ASSIST approach to learning score on each of the three main factors.**

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<sup>17</sup> The ACCA publishes only worldwide pass rates and individual results of students so no data on UK pass rates were available.

papers there was a significant difference between the surface scores of the passing and failing groups

To investigate the coherence of these two groups, the scores on each approach were split into quartiles and the results of each quartile compared. Table 13-2 summarises the performance of the deep scoring students to illustrate the quartiles in detail. The first line of Table 13-2 - labelled Q(uartile)1- shows that the quarter of students (twenty in total) with the lowest deep approach score comprised individuals with a deep score range from 9.0 to 12.75, ten of whom passed the examination and ten of whom (the remainder) failed it; the second quartile twenty-one students, whose deep scores ranged from 13.0 to 15.25 and of whom seven passed the examination and fourteen failed, and so on through the table. It is evident from the table that deep score is not related to examination success. Tables 13-3 and 13-4 repeat the analysis for the surface and strategic scores.

	Number	Deep		Pass
		Lowest	Highest	
<b>Q1</b>	20	9.00	12.75	10
<b>Q2</b>	21	13.00	15.25	7
<b>Q3</b>	20	15.25	16.75	10
<b>Q4</b>	20	16.75	18.75	9
<b>Total</b>	81			36

**Table 13-2 - Analysis of the deep ASSIST scores. The students are ordered into quartiles by deep score – the table indicates the range of scores.**

Although in Table 13- 3 it appears evident that a high (low) score on the surface variable is associated with a low (high) pass rate, on a chi-square test the chi-square statistic for the surface variable was 6.89, significant only at the 7.6% level, though comparing mean surface scores between the four quartiles showed that the groups were highly significantly different. Neither deep nor strategic scores showed any statistical relationship with examination success.

	Number	Surface		Pass
		Lowest	Highest	
<b>Q1</b>	20	7.50	9.25	15
<b>Q2</b>	21	9.42	11.50	8
<b>Q3</b>	20	11.75	12.75	9
<b>Q4</b>	20	13.00	17.25	4
<b>Total</b>	81			36

**Table 13-3 - Analysis of the surface ASSIST scores. The students are ordered into quartiles by surface score – the table indicates the range of scores.**

The surface score was significantly associated with examination mark achieved; a straight correlation between surface score and mark has a correlation coefficient of  $-0.32^{**}$ ; having a high surface approach score leads to a low mark. The deep and strategic scores on their own are not correlated with high marks.

	Number	Strategic		Pass
		Lowest	Highest	
<b>Q1</b>	20	7.40	12.00	8
<b>Q2</b>	21	12.00	13.80	9
<b>Q3</b>	20	14.00	15.80	11
<b>Q4</b>	20	15.81	18.80	8
<b>Total</b>	81			36

**Table 13-4 - Analysis of the strategic ASSIST scores. The students are ordered into quartiles by strategic score – the table indicates the range of scores.**

The surface factor sub-scales were also correlated with marks but only ‘*lack of purpose*’ correlated significantly ( $-28.2\%^*$ ) and overall correlation with aggregate surface score was both higher and more significant. Comparing sub-scale scores of passing and failing

students, three were significantly different: ‘seeking meaning’\*\*, ‘fear of failure’\*, and ‘unrelated memorising’\*, as well as the overall surface score\*\*.

Since passing is a categorical variable – and to pass is more important for students than a raw score - comparing pass rate with approach provides an alternative approach. A logistic regression of all three approaches against the pass/fail categorical variable again revealed only the surface score to have any statistical significance, significant at the 1% level.

### **13.3 CONCLUSION**

There was no evident relationship between deep or strategic ASSIST scores and examination success but a clear - negative - relationship existed between surface approach score and examination mark.

The next chapter examines performance of the ACCA students in solving a pair of specially designed case studies and compares that performance with their ASSIST derived approach to learning scores.

# Chapter 14 - Approaches and Level of Performance

## 14.1 INTRODUCTION

The Student Approaches to Learning framework relies on an assumption that differing approaches to learning will be associated with differing academic performance. It was clear from the research described in Chapter Five that academic performance may be measured using the SOLO taxonomy, or by achievement in academic assessment as part of a course. Chapter 13 examined the links between approach measured by ASSIST and performance in examination; this chapter aims to test whether such a link holds true in practice for the students under consideration when completing an academic task.

Two specially designed case studies were employed to assess how students approached the solution of a management accounting problem. The students' approach to learning had previously been tested using the ASSIST questionnaire and an attempt was made to gauge their understanding of how to solve the problem - thus giving an indication of the SOLO level achieved. The students' examination performance was also available so it was possible to triangulate SOLO level, approach to learning, and examination performance.

The first section of this chapter, 14.2, describes the sample of students who attempted the case studies and section 14.3 discusses their performance when working on the cases. Section 14.4 compares in detail the way students with differing approaches to learning tackled the two cases. The final section, 14.5, draws conclusions about the relationship between the students' approaches to learning and the learning itself; the section concludes with a reflection on the performance of the six students who passed the examination.

## 14.2 THE SAMPLE

Section 9.5.1 explained how the students were chosen – all were ACCA students due to take their examination in either December 2006 or June 2007. One student elected not to take the examination at the end of the course. Only two of the first (December) group were male; the entire second (June) group was female. Ten of the eighteen interviewees were native UK students, one had been born and educated at school to the age of eighteen in Africa, one

came from Malaysia, and the remainder from European countries: Poland, Italy, and Bulgaria.

Table 14-1 shows the approach to learning scores for the interviewees and their marks in deep approach score order, split between the two cohorts involved- students A to H were in the December cohort and I to R in the June one. The average deep score for the two samples was 14.2 compared with an average for all ACCA students of 14.6; the surface score was 10.8 compared with 11.3. On each scale the lowest student's score on each approach was about half that of the highest scoring student.

Six students passed the examination at the end of their course, four of the first group and two of the second - a pass rate of 35%.

	<b>Deep</b>	<b>Surface</b>	<b>Strategic</b>	<b>Final Mark</b>
Student A	12.3	12.0	13.2	50
Student B	13.5	11.5	14.0	37
Student C	13.8	13.5	14.6	35
Student D	15.8	9.0	17.8	65
Student E	16.5	7.5	12.8	42
Student F	16.8	6.5	17.6	55
Student G	17.0	11.8	18.6	50
Student H	18.8	9.4	18.8	43
<b>Average</b>	<b>15.5</b>	<b>10.1</b>	<b>15.9</b>	
Student I	9.3	12.5	14.6	36
Student J	11.3	11.3	12.0	34
Student K	11.3	8.0	14.4	60
Student L	11.5	11.8	14.2	50
Student M	12.3	11.5	13.6	36
Student N	13.5	9.5	12.0	
Student O	14.5	11.5	14.4	35
Student P	15.0	14.5	11.0	41
Student Q	15.3	12.5	14.2	34
Student R	17.0	10.0	15.4	38
<b>Average</b>	<b>13.1</b>	<b>11.3</b>	<b>13.6</b>	
<b>Overall Average</b>	<b>14.2</b>	<b>10.8</b>	<b>14.6</b>	
<b>SD</b>	<b>2.5</b>	<b>2.1</b>	<b>2.3</b>	
<b><i>All ACCA Students</i></b>				
<b>Overall Average</b>	<b>14.6</b>	<b>11.3</b>	<b>14.5</b>	
<b>SD</b>	<b>2.2</b>	<b>2.5</b>	<b>2.4</b>	

Table 14-1 – *Details of the two samples of students who completed the case studies showing approach to learning scores and the mark gained by each student in the examination*

### 14.3 RESULTS FROM THE CASE STUDIES

The students worked through the case studies described in section 9.6.2. The SOLO taxonomy offers five possible levels of understanding. Eliminating the extreme two - pre-structural and extended abstract - these students should have at least attained the uni-structural level, might be expected to have achieved a multi-structural level, and might have hoped to achieve the relational level. As applied to these students, uni-structurality implies familiarity with one of the various management accounting techniques listed in Figures 9-2 and 9-4, multi-structurality would imply knowing several or all of them. The relational level implies knowledge and familiarity with the connections between those techniques shown in the two figures.

It is possible to be more precise. In that at the heart of management accounting lie short and long-term decision-making, uni-structurality can be interpreted as being able to prepare a profit statement (short-term decisions) and a net present value analysis (long-term decisions).

The performance of the students on the cases can be summarised:

1. On both cases, all the students could prepare a profit statement (many of the students used the generic term budget - meaning a forecast profit statement - rather than the term profit statement *per se*) and a net present value statement with relative ease.
2. None of the students knew about the use of absorption costing for preparing financial accounts but once that point had been explained, all could correctly value closing stock – at that stage the split between fixed and variable cost had already been calculated. Break-even (cost/volume/profit or CVP analysis) and the high/low method drew the generally negative response discussed below.
3. Every student who completed the NPV analysis knew that the cost of capital was the correct discount rate, not the borrowing rate.
4. None of the students could use the variance analysis or expected value information without assistance.
5. All the students who mentioned the consultant's report treated it as a sunk cost.

In terms of level, the group was relatively, even extremely, homogenous; it rapidly became clear that every student in the group was perfectly able to produce a profit statement and carry out a net present value computation. Facility in the use of these two techniques was so second nature to all members of the group that this ability was taken as read and hardly

mentioned. They were also all able to distinguish broadly - though occasionally with some prompting - between variable and fixed costs and between labour, materials, and overheads.

All students were able to identify and deal with two areas - sunk costs and cost of capital - correctly (ignore sunk costs and use cost of capital rather than borrowing costs for NPV analysis) but these appeared to be rote-learned, certainly no student knew **why** cost of capital should be used. It also became clear that none of the students understood the relationship between the type of costing system used and the production of financial accounts. Thus, every student in the sample had achieved or surpassed the uni-structural stage but none had progressed through to the multi-structural. In retrospect it is clear that the cases were too difficult for the students, none could do better than be led through the various techniques required to solve the problems presented. But these were all students who had completed at least two management accounting courses, many having already passed an accounting degree. After successful completion of the paper they were about to take - or had taken - and the remaining ACCA examinations, they could go out into the world as 'experts' without any further education in management accounting

The four areas discussed below are those where there was some degree of difference between the performances of individual students. On each the student was given a score ranging from 0 - knows nothing of the technique - to 5 - is perfectly able to use and understand it. No students scored zero or five; the scores of 2 to 4 achieved by most students indicate an ability to remember the technique, usually after being given its name, thus not identifying either the name of the technique or how to use it without assistance. The range indicates the degree of help needed, invariably assistance was needed in both deciding what the student needed to achieve to solve the problem and in its computation. These scores, shown in Table 14-2, are necessarily subjective but are indicative of the students' understanding. The first two techniques are from the first case, the remaining two from the second. Each of the four areas is discussed below:

<i>Technique</i>	<i>Student</i>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>	<b>Q</b>	<b>R</b>	<b>Avge</b>
High/Low Method		3	1	2	4	3.5	2	2.5	2	1	1.5	3					1.5	3		2.3
CVP Analysis		2	2.5	1	4	3	2	2	2		1	3						2		2.2
Labour/Material Variances			2		2.5	3	1	2.5		2	2	3	2	2.5	2	3	3.5	2.5	3	2.4
Expected Value			2.5			3.5		2		1		2	4	3.5		2	1	2	4	2.5
<i>Average</i>		2.5	2	1.5	3.5	3.25	1.67	2.25	2	1.33	1.5	2.75	3	3	2	2.5	2	2.38	3.5	2.4

**Table 14-2 - Scores achieved by students on the four specific techniques in the case studies where a range of abilities was found. The scores are based on a six point scale where 0 equals 'completely unfamiliar' and five 'complete expertise'**

### 14.3.1 HIGH/LOW METHOD

The distinction between variable and fixed costs is critical to the whole of short-term decision-making and arguably the most fundamental aspect of costing. The first case required students to separate variable from fixed costs by establishing the change in costs at two different production levels. The technique most commonly used is the high/low method but the result could equally have been achieved using an algebraic method or even by simple common sense if the nature of costs was properly understood. In fact only one student in the group was able to handle the technique without assistance. Although all the others had a memory of it, none appreciated what it was able to tell them.

The best response came from Student D, who could identify the technique and use it with some assistance:

*'Oh the high/lows ....so that would be – yes I have to do it at the overall 600 and 400 haven't I?'*

Most students had at least some memory of the technique:

*'I know there is a way of doing this I did it at AAT'* (Student F) and

*'it must be so obvious to me another day another mood; ..I did [hesitant] high/low method obviously I know that term...umm..in its application I didn't know but this. ..this is commonsensical isn't it'* (Student B)

*'[have you heard of the high/low method?] yes but I don't know it in detail (and didn't!)'*  
(Student K)

Student H produced a much more typical response, only understanding after explanation the difference between fixed and variable costs.

*'They are fixed aren't they so they should be the same..[per unit or in total?].umm the 200 is the same ..[exactly]...it's the 200 that is the same not the per unit 'cause the fixed costs is not based on the units is it?' (Student H)*

Student P expressed something of the confusion clearly felt by many of the students:

*'so what costs would be included in that cost per unit marginal - its all so vague'*

confusion shared by Student C

*'Oh, so you deduct it...and then you do the 50 over 200, or is it the other way round?'*

Student I,

*'[OK so when you produce more which one changes, the direct cost?] No the fixed costs if we produce more – [oh fixed costs per unit you mean?] Yes [because in total fixed costs won't change] yes, yes they both will change because we produce more but..'*

and Student J

*'[are they fixed or variable?] Variable I would think [No]'*

Of course some students showed good understanding and were able to use a more mathematical technique to achieve the same results:

*'I just use x and y to make an equation and try to do it my own way' (Student E)*

The above appears to indicate a significant degree of misunderstanding about the most basic part of costing even amongst students with considerable experience of having studied the subject.

#### 14.3.2 CVP ANALYSIS

CVP analysis is one of the basic techniques of short-term decision-making. Understanding it fully implies understanding the relationship between fixed and variable costs. The inability to separate out fixed and variable costs was reflected by the fact that only three students correctly remembered that finding the breakeven point involves dividing fixed costs by contribution and that after something of a struggle:

*'that ratio, I can't remember which one it is ..the break-even point [yes, could you do that] ...contribution over no yes fixed costs over contribution' (Student D)*

*'The break-even point is fixed cost divided by contribution?'* (Student B)

*'Kind of ..no ..on tip of tongue break-even?..[Yes..can you work out?]...Oh god I'm thinking of the graph ..sum of x..y no that's the regression...Fixed Costs/Contribution'* (Student A)

There was a range of other responses. No student was clear either about how to calculate break-even points:

*'fixed costs divided by cost of production or ..contribution per unit'* (Student K)

*'the point where sales equals zero contribution'* (Student C)

*'use the variable, no, use the ..variable divide by no, how many units, no it is wrong ...oh I know, variable divide by the fixed...'* (Student G)

*'I can't remember the formula but it is something to do with how much does it contribute towards something'* (Student E)

*'I can never remember break-even'* (Student J).

Or, and more importantly, in what circumstances it would be used:

*'Variable costs leading to decision making - no not really'* (Student C)

*'Which of the projects would bring profit first? Can't think'* (Student K)

This is far more than remembering a formula - a good understanding of the relation between fixed and variable costs would render remembering the formula unnecessary. It was clear that all the students considered it as a separate technique and a formula to be learned without any of them truly possessing an understanding of how and when the technique should be used in practice.

### 14.3.3 VARIANCES

Several of the students commented that they found variances a very difficult area of the syllabus:

*'For variances I was really lost in class ..I did find them really difficult'* (Student N)

*'don't tell me it is something to do with variances'* (Student H)

The interviewees were provided with standard price and standard usage information for materials, plus price and usage variances over a two-year period. To resolve the case, students had to use the variance information to deduce the actual amount of material used and price per unit thus being able to calculate the total price paid. Not a single student was able to arrive at the necessary analysis without help although several were able to see that the variance information could be used to get at actual price and quantity paid and used.

*'you don't know what the material costs are..but I've got the variance'* (Student M)

*'Yes, 'cause we're going to use the variance to work out what we need for the prices'*  
(Student L)

All the students (with the exception of one student who gave up on the case at the point of trying to compute the variances) were able to carry out the correct computation once they had been given the formulae for calculation of the variances though some - clearly those whose mathematical ability was greatest - found the task easier than others. The 'European' group gained an advantage having all studied mathematics at least to school leaving level but every student was eventually able to carry out the task.

*'I guess I have to take into account the variance now – [do you know how to do it?] - I think I would prefer your help'* (Student O)

*'Direct material is a variance of – of sales prices and overheads? ... I don't know how to [... do you remember the equations for price variance and usage variance?] Yes.'* (Student P)

*'when you told me what to do then I know how to do it'* (Student R)

Though some students displayed a degree of uncertainty

*'actual is what you actually did use and standard is what it should normally cost you is that correct'* (Student N)

As with break-even point, students were generally poor at remembering the formulae involved, able to perform the calculation (they were not actually asked to calculate the break-even point - it was not fundamental to solving the case), but displayed little confidence about when the technique should be used.

#### 14.3.4 EXPECTED VALUE

This - essentially a weighted average - is not a key aspect of management accounting, though it crops up frequently, and might be seen more as a test of numeracy than of accounting ability. As such it is interesting to note that it received the highest scores across the board of any of these four techniques. All the students had a general idea of how to use the method, though – as with the previous techniques – most had to be shown the detail. Not all were familiar with the name:

‘[do you not know this expected value technique?] *No*’ (Student P)

‘[can you remember what that is called] *no*’ (Student I)

Though this may simply have been an issue of not being a native English speaker..

In the case three possibilities were presented but only two had probabilities attached, the students had to work out the third probability – 50% – by knowing that the probabilities had to total to one. Several students were able to spot the missing figure:

‘*Is this like expected values? [You got the fifty!*<sup>18</sup> I deliberately made that unclear and I thought I had made it too difficult. One of your flatmates got it yesterday]’ (Student L)

‘*usually they give you all the percentages and they add up to one*’ (Student R)

‘*that leaves you with a 50% chance it’s going to be 20%*’ (Student B)

However, as it came towards the end of the second case, not all the students actually got as far as this technique.

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<sup>18</sup> The missing value

All these students lay between the uni-structural and multi-structural levels. All had mastered the basics, plus some knowledge of a series of other aspects of the subjects. None could be said to have complete mastery of any other part of the course; none was able to solve the cases without a considerable degree of help, implying that they did not have a relational view of the subject but neither were any - with the exception of two students discussed below (section 14.5) - unable to complete either of the two cases once they had been pointed in an appropriate direction.

#### 14.4 APPROACHES AND THE SAMPLE

If the approaches to learning methodology is to be genuinely useful it must have something to say about the way students actually tackle their learning. The analysis that follows examines the way that students with different approaches attempted to solve the cases set. The first part discusses the students in order of their deep and then surface learning scores. The second looks at the performance of individual students taken from opposite ends and the middle of the deep and surface score ranges. The strategic approach score was considered but did not appear to possess any explanatory power over and above the deep and surface approaches described below.

##### 14.4.1 THE DEEP APPROACH

If the students are placed in order of their score on the deep approach, as shown in Table 14-1, a clear, and somewhat surprising, result emerges. The least deep scoring students appeared better able to take an overview of the situation. As noted in section 11.3.2.2, the learners with a higher deep score were seeking rote learning. Take the responses of the six students scoring 12.25 or below on the deep scale to the question what were they being asked to do. In order of deep score they were:

*'well we have to compare the two possibilities of finance the project and what we are going to do NPV or..'* and *'the question is asking me if the reorganisation is worthwhile'*  
(Student I)

*'You have to find whether the reorganisation is worthwhile or not. I think something like that'* and *'You have to compare two alternatives for sure'* (Student K)

*'is reorganisation worthwhile and will there be a saving or will they actually go ahead'*  
and *'the last bit is saying what will be the profit over the last three years, the middle bit is comparing the alternatives'* (Student J)

*'Is it to do with the NPV? ..... Is it like – trying to look at the costs versus the benefits?'*  
(Student L)

*'compare now with the reorganisation'* (Student M)

*'it is obviously an investment appraisal question ... so what I always find it difficult to get my head around is where to start'* (Student A)

Note the focus of the least deep students tends to be on solving the overall problem; in contrast the students with a supposedly deeper approach tend to a more technique driven approach. Taking the six students with the highest deep scores, deepest first.

*'What is this asking to do, a budget or something'* (Student H)

*'the cost, the unit cost ..... first thing is the percentages ....'* (Student R)

*'It is mixing NPV, and then I will use 10% for the NPV and then this ..first thing I would do is work out how much is the cost in total, which is necessary.'* and *'I think I will find the standard cost first..and I will work out using I believe using the probabilities'* (Student G)

*'well presumably they are wanting to know what level would be the most profitable'*  
(Student F)

*'I kind of know what to do but I am not sure of how to ... I think you find the cost of this and then you find out the contribution it is like you have to compare two' and 'I don't have the strategy, I am just doing it .. I am just working out the profit.. and then profit minus fixed costs that would be contribution would it'* (Student E)

*'So basically its like asking me to calculate the two levels of sales and the expansion of the building and compare the two' and 'I've got the past three years sales so I've got to work out how what the increase looks like a certain percentage and then carry it forward.'*  
(Student D)

Although the correlation is inexact, the students with a low deep score generally take a problem based over view of the situation and focus on that. The deeper approach students are more tied to a technique driven approach and see the issue as solving a particular type of problem. The reason may be tied to an explanation articulated by Student C, herself around the median in terms of deep score but reflecting a view expressed less coherently by other students – at several points through the discussion she emphasised the importance of locating an appropriate format to guide her through the question

*‘when you look at an exam question it seems much easier than what you are asking because now that it is all jumbled up I find it difficult to pick it out whereas when you do past exam questions they clearly, within reason, they are asking you specifically what they want from you so straightaway the wording that they use gives you like oh OK you know you have to do NPV or ..this is how I do it I relate a standard pro forma..so if the words don’t jump out at me when I am reading it then I don’t know what ..that is how I look at it’*

Reinforcing the points made in sections 11.5.2 and 11.3.2.2 that the students tended to perceive depth as synonymous with being able to do and that rote learning was associated with a higher deep score.

#### 14.4.2 THE SURFACE APPROACH

When the students are ordered by surface score, the position is much less clear. Both groups of students show a mix of technique and problem orientation. Take the six highest scoring surface students (highest first):

*‘First of all I need to find the overheads and direct materials and then once I have got that, do it for three years ago and then I have to recognise it for three years ahead’  
(Student P)*

*‘I have the format in my mind and then once I have the format I know I can work it out that way...I don’t know how to lay it out number one, where to start, what is the question asking me to do where do I start whereas NPV I know exactly what I am doing, I am laying out my years, I know my discount factor and I go’ (Student C)*

*'I think I will have to calculate – I will have to calculate the impact of the reorganisation on the actual sale and cost and take into account the price variance and quantity variance' (Student O)*

*'The problem I always find is that I jump into the questions and start working away and then I find something that I missed.... I am too inclined to jump in ..... its obviously an investment appraisal question' (Student A)*

*'I think I will find the standard cost first....I will work out using ... using the probabilities to find ..' (Student G)*

Student L (See Above)

And compare with the six lowest (lowest first):

*'The consultant's report is a sunk cost – so that can go out of the window. Well that bit's got something to do with contribution, possibly. Well presumably they are wanting to know what level would be the most profitable' (Student F)*

*'I kind of know what to do but I am not sure how to ... should I just tell you what kind of and then ....I think you find the cost of this and then you find out the contribution' (Student E)*

*'You have to find whether the reorganisation is worthwhile or not. I think something like that.' (Student K)*

Student D – see above.

*'What is this asking to do, a budget or something?' (Student H)*

*'NPV? .....Sensitivity analysis? [she meant expected value] ... so this is the reorganisation we have got over three years year 1, 2 and 3. We are going to have to do, to see whether it is worthwhile basically on the amount of money coming in and the amount of money going out' (Student N)*

There is little in these transcripts to suggest any major difference between the two.

### 14.4.3 DETAILED ANALYSIS OF THE DEEP SCALE

Student H was the highest scoring student on the deep approach scale with a score of 18.75 and the second deepest was Student G (17). The least deep in approach was Student I (9.25) and Student K had the second lowest score of 11.25. Student O and Student C were the two median students; their scores were 14.5 and 13.75 respectively. Performance on the first case is discussed for Student H, Student C, and Student K, and on the second case of Student G, Student O, and Student I. There was no link between the approach scores and their understanding as evidenced in Table 14-1.

#### *Student H - (Deepest)*

Student H's initial thought was that this was a budget question. She initially worked out the profit and loss statement for the first year and then realised that to bring the profit statement forward she needed to establish a breakdown of costs to find out the amount of costs at a production level of 75,000 units. She, with prompting, established that variable costs would change. At first – in common with most of the students – she looked at the breakdown of costs given in the case but was told that would not work. She realised that the two production levels should be sufficient for her to identify variable costs but was unable to do so '*it is obvious, I can't think*' and eventually had the high/low method explained to her. Having established the variable costs, she – with a bit of prompting – could get at the fixed costs '*it's the difference isn't it....it's a shame, you know these things but then you look at it and think..*'.

She then started to prepare a profit statement at 75,000 units but made a fundamental error in using the same value of fixed costs per unit '*they are fixed aren't they so they should be the same*' instead of in total. At this point she was not sure how to proceed and so was asked what she is trying to decide '*reduce production costs or maximise profit*'. With this information she proceeded to prepare the profit statements. She decided on the best alternative '*its worth building the new factory*' and was then asked about other possible decision criteria. With some prompting '[contribution.. does that ring any bells?] ..to find out ..what is it called ..[break-even?].yes' but was unable to say how that would be calculated.

The next part related to the use of the information to prepare accounts. She wasn't able to recall the two main costing systems but on being told marginal and absorption said '*I thought that and thought that was too obvious*'. The use of absorption costing to prepare

financial accounts had to be explained but she was able then to value the year-end stock relatively easily. At this stage she commented on the difficulty of the question:

*'Reading it. it reads a lot more complicated...reading it, from what I have done it seems a lot more complicated ... so how do you know, because without you pointing and prompting me in the right direction, reading this, I would have known the first part but that second paragraph probably but then I would have thought what the...'*

She recognised the last part as an NPV calculation and initially was looking for a loan – the NPV method is independent of the financing used – but recovered herself *'no its not that is it'*. She completed the NPV calculation with relative ease and finished the problem in about three-quarters of an hour.

### ***Student G - (Second Deepest)***

Like many of the other deeper approach students, Student G immediately went for a technique-based approach. *'I think I will find the standard cost first....I will work out using ... using the probabilities to find ..'*. With only minor suggestions was able to produce the profit statements and made a good stab at the variance analysis *'got it standard price – actual price x actual quantity will be price variance and quantity actual usage [no] standard usage – actual usage x standard price'*. The computation, Student G handled very well but he struggled in trying to get an overview:

*'[step back and think about what you are trying to evaluate?] profit [assuming what?] the sales to the cost [but why are you doing that]in theory I am doing the budget so I want to know [its not exactly a budget] analysing ..how much the cashflow or ..cost [what exactly are you trying to evaluate] performance [compare what with what .. possible reorganisation?] NPV – this project whether to do or not [exactly so compare what with what] compare with net profit [two net profits which are?].firstly I have to compare if this factory carries on or not then ....new machines [sort of] what cutting costs [explains about cost reduction so what comparing?...well if do reorganise versus if don't reorganise] OK'*

Finally he completed the expected value calculation with reasonable ease. The case was stopped after 55 minutes before Student G had arrived at the net present value section but typically this took less than five minutes so he effectively finished in close to an hour.

### *Student O – (Median Deep)*

Student O was an accounting graduate with mathematics A-level, and of particular interest as one of three students (the others were Student L and Student M) who had completed their degree together, had moved to London and gained jobs working in accounting departments, sat together in the class, and had almost identical surface scores (11.5/11.75/11.5 respectively), with deep scores (14.5/11.5/12.25) that exactly reversed their eventual marks (35/50/36). All had passed mathematics at either A or A/S level. All three said at their first interview that they did not wish to attend for a second, the only three students to do so. Two others refused to return at a later point and others were prevented from coming for other reasons.

It is not at all evident from working through the case that there was any significant difference between the three in terms of accounting knowledge and ability. The only noticeable difference between them was that Student M was evidently a deeper thinker than the other two – she tended to sit quietly gaining understanding and then emerge with a conclusion, usually one better thought through than any of the other interviewees. This tendency was unique to Student M amongst the group and perhaps captures an element of ‘deep’ thinking not picked up by the ASSIST questionnaire.

Student O was able immediately to pick out an overview - ‘*so we’ve got to do a before and an after?*’ - then cast around for a technique to attack the problem with - first, like the others, seeing the expected value, then after some discussion lighting on sales ‘*so we would want to look at the sales I would have thought then*’, then casting around further ‘*So, would we use things like sales rising in line with overheads?*’, on prompting ‘*It is just about trying to get the first spade into the ground*’ she responded ‘*Yeah – I really don’t – I can’t think of what the first spade is!*’. After the suggestion of producing a Profit and Loss Account she was able to work her way through the question. She picked out the use of variances well – ‘*the volume of sales ... but there is still a price variance* [very good, yes] *so – shall we use that for now?*’ She calculated the variances relatively easily but then needed some guidance about how to use the results ‘*The price and the quantity. [So if you have got the price and the quantity, what have you got?] Sale amount?* [Cost amount, yes. Because if you sell 5 at a £1 each, it costs £5, right?] *Yes* [So that gives you the – what can you fit in there?] *Materials in there?* [Yes, exactly. So if you have used 11 million kilos of materials and £5.25 per kilo...] *Right* [... that is the cost of materials that you have used. ]’.

After completing the analysis of past costs and revenues, she had a clear idea of how to proceed:

We have got to think about what is going to happen in the future from then on. *‘So we want to know what happens if we carry on as we are without reorganising. [Spot on – yes] and then what would happen if we do reorganise’.*

There was some discussion about the difficulty of drawing information spread around the case study in some logical framework that reflected the format problem mentioned by several of the students:

*‘[Well, even the ACCA do that. They drop bits of the question around]. It muddles me. [You need a logical train of thought, I guess] Yes. [And would you say that is how you try and answer questions as well? You try and get things from a logical place?] Yes, definitely... I need to get things organised in my mind’*

For the final part of the question she was able to quickly establish without prompting both that incremental costs were involved:

*‘[how would you now just finish off the calculation?] Um, well you’ve got incremental costs for each one...’*

and that an NPV analysis was needed:

*‘Then you would want to know the present value of those’*

Student O took a relatively long time to complete the case, in part because she insisted in calculating whole amounts rather than in millions, which would of course have been much quicker.

At the end she was asked:

*‘[Did you find that useful] Yes, I think I did, yes, It got me thinking back in the mode of – different things relating together’*

Note the ‘back’ in her last sentence suggesting perhaps a return to University values and a recognition of the importance of connections.

### ***Student C – (Median Deep)***

Student C was extremely technique focused and throughout the case kept referring to her need for a 'format'. *'I have a format in my mind I read the question and that's budgets or that's NPV and then once I have the format I know I can work it out that way'*. She read through the problem underlining key parts then said *'now I have to work out what it is asking me to do .. this is the total direct cost per unit is this?'*. So in fact she arrived at a key issue quickly and started off producing a profit statement without prompting *'[So what you are doing is comparing the current situation with the future?] Yes, I realised I should do like a budget'*. Continuing she pondered *'I'm not sure if I'm saying budget flexed and actual'* and was asked about the type of question she was trying to answer:

*'Well, I have to put it into a technique as I said so I can understand .. what I am reading is this is that I have to do a budget 'cause they have given me selling price they have given me a new selling price and new units being sold and then what are they saying [reads part of the case] I'm going to analyse so do I want to do a budget and an actual and compare the two?'*

and then:

*'I saw the cost of capital way down here I was thinking right so .. then they were telling me about this year and next year so is it part budget and part investment appraisal?'*

She then proceeded, with a fair degree of support, though not on the mechanics of the calculations, to work out the profit statements. She worked out herself that she needed to calculate the direct (variable) costs per unit. As with other students she worked towards the high/low method but eventually it had to be demonstrated to her. She also had to be shown how to get at fixed costs, although the explanation was a little longer than for most of the other students this may very well have been more a personal feeling of need for support than actual lack of understanding. This effect on the part of high surface score students has been noted above. As she commented a few minutes later:

*'sometimes you panic so much that you don't even think about adding up and taking away'*

The implication that the interview is not a stressful situation has some interesting implications – is the difference between SOLO classification and examination result simply the effect of stress on the student? Finally, like the others, Student C arrived at the option with highest profit and concluded that to be the preferred choice. When the idea of using break-even analysis was introduced as an alternative, exactly like everyone else she was unable to remember the term, '[break-even] *oh break-even*', in a tone that implied 'of course'. Although unable to remember the formula she did say '*the point where sales equals zero contribution*' (actually where contribution equals fixed costs and sales equal total cost).

She managed to remember the two costing systems after some prompting, and also that absorption was used for financial accounting, though without knowing why. She had no problems working out stock value.

Lastly, the NPV part was tackled without any difficulty and finally, on being asked, she recognised the sunk cost. The whole was completed in around 55 minutes.

Student C volunteered to return for a second interview to complete the second case but failed to start the question. Some of her comments on that occasion were relevant though:

*'I'm really not going to be able to do it. It just feels..like too much..I don't know where to start ..the thing is too complicated, funnily enough in a real exam as soon as you look at it you know what you have to do'*

A very good example of uni-structural learning.

*'It has been a long time and the truth is for me I learn things to get through, unless I am working with it constantly, or unless I have worked with something for a long period of time then OK I know that one but to get through exams really, because I don't work with overheads and stuff I don't work with them. It isn't something I can learn by reading textbooks, I learn by doing'*

Student C was certainly aware of her own learning type.

*'If I don't read my 2.4 textbook for a couple of weeks or a few months then I'm back and its gone [you were not particularly surface<sup>19</sup>] I must have lied'*

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<sup>19</sup> Actually she had the second highest surface score.

***Student K- (Second Lowest Deep [and Second Lowest Surface])***

Student K picked up very quickly on the problem ‘*You have to compare two alternatives for sure*’ and almost immediately afterwards ‘*work out what cost per unit is*’ then ‘*are they variable or are there fixed costs as well*’ and ‘*I have to figure out which ones are fixed ones*’, she too tried to use the costs listed in the question but then had to be pointed at the high/low method ‘*well yes but I don’t know it in detail*’ and, with a little assistance, arrived at the variable costs per unit and fixed costs. She shortened the time to solve the problem by only considering incremental costs rather than preparing complete profit statements. Like all the other she had to be pointed at break-even as a possible other decision criterion but got reasonably close to remembering how to calculate it ‘*I’m not quite sure, fixed costs divided by cost of production or ..[nearly] .. contribution per unit*’.

Moving on to the use of management accounting information to prepare accounts, Student K quickly identified the two systems but wrongly guessed the one to use ‘*Can’t use both? Probably marginal because it is just variable*’. She calculated the stock value with relative ease.

Like several of the others she was looking for a means of financing the expansion ‘*I would say that this is related to the 50 million that they can borrow*’. She then completed the net present value computation. The whole exercise was completed in less than half an hour, even more impressive considering this was her second case when she claimed ‘*obviously you remember things when you are practising; before the exam everything is in your head more focused before the exam, after the exam just forget things*’. This may provide some evidence of consolidation of knowledge going on, which explains for virtually all the students why there was little evidence of deterioration of performance.

***Student I – (Lowest Deep)***

Student I was confused initially ‘*Its quite confusing with these percentages*’ but quickly picked up on the major issues and spotted that the question is about ‘*if the reorganisation is worthwhile*’. Student I showed good understanding throughout, and was the quickest student in calculating the variances, though she had to be given the formulae, but, as a Bulgarian student, she had done ‘*lots of maths*’. Like virtually all the others though, she was unable to progress through the question without being prompted at every stage. She was able to calculate the expected value and project all the cash flows one year into the future within an

hour, when the exercise was halted, so was only a short way away from completing the whole case.

Of the two students with the deepest approach, Student H scored 43% in the examination and Student G 50%; the two with the lowest deep approach score, Student I and Student K achieved 36% and 60%, and Student O and Student C, the two median students both got 35%. Taking these students, the overwhelming evidence is of similarity not difference although with a greater tendency on the part of the deeper approach students (and Student C) to adopt a technique based approach. Even though Student H's score on the deep scale was more than twice that of Student I's the way they tackled the problems was essentially very similar. All the students knew virtually the same things and were able to perform the same computations. Particularly striking was the reliance by Student C on a set format to identify the nature of the problem with which she was dealing, a reliance that reflects the approach of several of the others also (see Student F below for example). Student K's case is rather different. Her performance almost certainly reflects considerably greater intellectual ability than the others but it is striking how similar her attempt at the case was.

#### 14.4.4 DETAILED ANALYSIS OF THE SURFACE SCALE

Student P was the highest scoring student on surface scale, she had a score of 14.5; at less than half that number (6.5) Student F had the lowest surface approach. Student M and Student B, with scores of 11.5, were the median students. Student C (13.5) discussed above, and Student E (7.5) were the second highest and second lowest. Case one is discussed for Student C (above), Student B, and Student F; case two for the other three

##### ***Student P – (Highest Surface)***

Student P (Student P), an Italian student, was the second oldest of the students interviewed. Like all the overseas students she had studied mathematics throughout her school career and possessed an Italian Diploma in Accounting. She quickly got into the question '*first of all I need to find overheads and direct materials and then once I have got that, do it for three years ago and then I have to recognise it for three years ahead...so how do I do it?*' and was able to produce a profit statement for the first year without much difficulty. She also remembered the variance equations and rapidly solved them without much support. With some guidance she established the change in price and volume of the various cost elements and worked out that there was an increase in material price inflation.

With very little prompting, and virtually no support, Student P was able to calculate the future three years on the assumption that no reorganisation took place. She had not met the expected value technique before and it had to be demonstrated to her but she picked it up very quickly. At this stage 45 minutes had passed so Student P just calculated one year into the future. She was one of the quicker students on this case, demonstrating good understanding throughout, and, although she did not have time to complete the three years into the future, was able to explain how she would have carried out an NPV analysis to assess the extent of the potential savings.

There was nothing in Student P's approach to the problem or way of dealing with it, that suggested she had a surface approach and, comparatively, seemed to have a good understanding of, and interest in, what was going on.

#### ***Student M – (Median Surface)***

Student M was one of the three students discussed above (see Student O); she tended to wait some while before responding to comments but then usually replied with a well considered answer. She quickly understood the issue '*compare now with the reorganisation*' but needed some prompting to start '[what would you normally expect costs to be broken down into?] *Fixed and variable?*..[so you should find that information reasonably..] *I'm not sure where* [can you see anything that gives you fixed costs...]' but, once started, was able to calculate the first year without too much prompting.

Like many of the other students, she had to be shown the variance equations, and why they were needed had to be explained, but was able to carry out the calculations without any problem. She was one of the few students who saw that the price and usage of materials of materials were rising at different rates.

Although initially hesitant about calculating expected value, Student M was able to cope with the missing probability value and calculated the expected value without prompting. She only had time to calculate one year's figures forward and explain the NPV calculation but it was clear that she had a good understanding of the situation. Student M's interview was characterised by her speaking very little but tending to get the correct answer with relatively little prompting. The fact that she and Student B – the two median students – were almost polar opposites in this respect suggests that depth of approach is unrelated to a tendency, or possibly ability, to articulate the nature of a problem.

### ***Student B– (Median Surface)***

Student B, in her late 30s, was one of the oldest students in the group with a tendency to be rather anxious and unfocused, so her opening remark was not unexpected *‘I just have difficulty absorbing the question maybe it is because I have been running around’*. However she quickly got into the question *‘well it is asking me to compare a sort of standard against a flexed budget’* and proceeded to draw up two comparative profit statements. Like virtually everyone, she had some fundamental level of knowledge about fixed and variable costs but was unable to apply her knowledge to the specific situation and had to be led through the split between the two, *‘high/low method obviously I know that term..umm..in its application I didn’t know but this, this is commonsensical isn’t it?’*. With not a lot more guidance she was eventually able to correctly produce the relevant profit statements.

On being asked for an alternative technique, she raised a few possibilities: *‘opportunity cost, other revenue stream ..... Limiting factors ..... relevant costs.. ..contribution per limiting factor’* and eventually, with a lot of prompting, arrived at break-even analysis. Again with some prompting *‘contribution....projected sales divided by contribution’* she was able to arrive at the correct formula.

She realised that marginal cost accounts would be different from financial accounts but had to be pushed to conclude that this meant these accounts were absorption based. It took a while to realise that stock would be affected most by the costing system used *‘oh yes, yes, yes of course’* and, again with some help, she was able to value the stock correctly *‘this is not tricky stuff is it?’*.

Student B quickly realised the last part of the problem was an NPV analysis and was able to complete the problem with only a small amount of support. The whole took around 55 minutes. Student B was able to explain her work as she went along – unlike some of the interviewees who spent quite long periods working on their own. Whether this speeded up her work – by identifying problems quickly – or slowed it down – because of the level of discussion – is impossible to determine.

### ***Student E – (Second Lowest Surface)***

Student E was a bright, ethnic Chinese student from Malaysia who, under parental pressure, had qualified as an optician. Accountancy was her preferred choice of career and she was

attempting to qualify whilst working full-time as an optician. Reading through the case, Student E picked out various techniques,

*'oh I remember variance now. I do I do remember variance. Yes yes yes, I do now. OK [reads] ..these costs are all costs, fixed and ..[ ] OK. [reads] Where are the fixed overheads here? What's the figure for fixed overheads before the reorganisation? Indirect - oh my God'*

Her next step was to (correctly) dive into the problem through a profit statement approach:

*'I don't have the strategy, I am just doing it .. I am just working out the profit.. and then profit minus fixed costs that would be contribution would it?.... how terrible I am at the subject'*

Note some lack of confidence even though the approach was perfectly correct. Like the others, she noted the expected value part of the question. Having calculated the first profit statement, she moved on to the variances. Although unable to exactly remember the formula for the variances – or any alternative approach – she was fairly close, and able to compute the variances relatively easily. Student E's interview had to be conducted over two weeks so the work was broken off at this point and resumed the following week. On beginning again, to get her restarted, Student E was asked how she saw the question:

*'OK, ... .. we need to find out what the exact cost is before the what ever and through the variances we find out what the exact situation is and we've found that now and we need to find out if you want to have this renovation or whatever then whether there will be a positive NPV value'*

Which nicely combines the technique based thoughts with a problem-based approach. At this point she became a little confused about what was happening when, possibly because of the week's interruption of the interview, but eventually managed, with some prompting to calculate the profit statements. She also managed the expected value with some ease. However she became confused about what happened if the firm didn't reorganise (nothing). Although she was able to complete the case, Student E was critical of her ability to work without prompting:

*'Well it's all from you really, I just do whatever, I have to do more thinking really... I'm always reading the question I'm very bad with the question that has so many [parts], if*

*it says 1 2 3 4 5 but if it's like this I find it difficult to go back and read it. I try to find that information but ...'.*

One possible problem for Student E was a language one; although several of the students were not native English speakers, Mandarin presents a particular problem because the representation of time is via an auxiliary rather than by use of a tense change. The problems Student E encountered in sequencing events perhaps resulted from this cause:

*'I find it difficult yes mainly because I've never learned, I can speak English but it's not my first language so when it comes to questions like this I'm actually slower in implication than normal, a normal British person for example so it takes me more time then I go back and it's just too much time'.*

#### ***Student F- (Lowest Surface)***

Student F, the oldest and lowest surface scoring student, spotted the sunk cost straight away and also homed in on the key issue *'Well presumably they are wanting to know what level would be the most profitable. So you would have to work out the figures I would imagine for 100,000 units and 75,000 units'*. After a little discussion she arrived very quickly at the cost problem *'are these direct costs?'*. As with the other students she immediately tried to use the list of costs in the question but eventually the high/low method had to be explained *'I did at the AAT .. I can't remember how to do it'*.

Having worked out the first profit statement she hesitated *'I really don't know what it wants me to do next'*, this was after 25 minutes, so relatively slowly. Student F had some problems working quickly with the numbers, possibly because of her relative age. In another five minutes she had finished the three profit statements so was able to work quickly enough once she had decided what needed doing.

As with the others she had to be told about break-even analysis as another potential tool. She did remember that stock was the key to the difference between management accounting and financial accounting, indeed that it was the profit part of the stock value that made the difference, and that absorption costing was the one used for financial accounting. She had no problem with the stock valuation under absorption costing. Again before the last part she hesitated – the following conversation could easily have been with Student C at the opposite end of the surface scale:

*'So what is that? I don't know what it needs to do. That's what I find is the trouble with most of these questions, half the time I just don't understand what they want me to tell them.*

[Just what technique it is after?]

*Yes*

[Just out of interest because you were saying you like to have things in boxes, is that how you see the subject?]

*Well kind of I suppose because I am quite - I don't like it when things are not very explicit.'*

She did, however, with a little prompting identify NPV as the correct technique to be employed for the final part of the question. In common with several other students she started off by looking to see how much money was being borrowed but eventually successfully completed the computation in less than three-quarters of an hour.

Comparing these students reveals similar findings to those discussed above, where similarities considerably outweighed differences. Only Student F of this group passed the examination; in order of surface score, the marks were Student P (41), Student C (35), Student B (37), Student M (36), Student E (42), and Student F (55). Neither in level of understanding, method of approaching the question, or performance in examination, is there anything to suggest that surface score affected these students' performance, although from Chapter 13 it is evident that there is a general tendency for surface approach to be related to examination grade.

#### **14.5 CONCLUSIONS**

In practice the sophisticated experimental method used proved unnecessary; with the exception of the two students discussed below, no difference could be detected between student performance on first or second interview, nor on level of performance between the two groups or between the two cases. For all the students on all the cases, their knowledge of two basic techniques was very good and of the surrounding areas much less good, though in most cases this understanding appeared undiminished some time after the examination.

There were only two exceptions to the general rule. Student C was unable to even start the second case - since the failure was not on any particular technique it may well be that the inability to proceed was more a lack of motivation, on a hot summer's evening after she had been at work all day, than of understanding. Student F started the second case but was unable to calculate the variances and abandoned it at that point. The interview was carried out immediately before the results came out (she passed with a score of 55%) and the most likely problem was nervousness about the outcome coupled with a problem with mathematics rather than any underlying lack of understanding. She was also the oldest student in the group, which undoubtedly increased her level of concern about the examination result.

Three conclusions arise from this part of the exercise and evidence from the previous chapter; the first provides support for previous studies relating to the depth of study typically achieved by students. The present study is entirely in line with that previous work. The second and third relate to the performance of individual students with different approaches to learning on the two case studies.

- 1) *This study accords with previous research (section 5.1.2.2), which found the level achieved by students to be rarely beyond the multi-structural and with Davidson and Baldwin (2005), who found that accounting textbooks also reflected a relatively low level of achievement.*

Whilst this finding is of little surprise for academics, it has importance for accounting educators. These students may be studying management accounting for the last time in their careers. Although nobody would imagine a newly qualified accountant to be an 'expert' in everything they studied, the strong implication is that post-qualifying education for accountants might usefully incorporate technical material. At the moment the ACCA's post-qualifying education is limited in scope and generally not of a technical nature.

- 2) *In contrast to some of the studies carried out on students taking university-based examinations, there is no relationship between score on the deep approach scale and examination performance.*

This part of the analysis goes to the heart of what the students understand by a deep approach. The suggestion – supported by the students' comments in section 11.5 – is that depth is seen by these students as synonymous with knowing a technique.

The precise meaning of 'deep' in the literature does not correspond to what students understand by 'deep' learning.

It is possible that professional examinations are simply of a different nature from university based ones. Even though the ACCA's examinations cover similar ground to those at universities, pass rates are generally much lower and the scope of knowledge demanded of the students much greater. Many of the university based students commented on the importance of their teacher setting the examination – it gave them clues about the type of question they might expect not available to the ACCA students. An additional explanation emerged from the interviews; students with a deeper-scored approach appeared very technique focused – their less deep counterparts in spite of, or more likely because of, their lack of 'depth', were better at taking a problem-based overview of the situation. Possibly in the type of examination these students were taking, the ability to overview counterbalanced the lack of depth. The university students studied here had deep scores measured by ASSIST not significantly different overall from the ACCA students and there is no reason to believe that they were less technique focused than the ACCA students, several of whom had accounting degrees. The most probably explanation for the discrepancy between this and other studies is in the nature of the subject rather than the difference between ACCA and undergraduate students.

- 3) *As in the previous chapter with the larger sample, these students showed (negative) relationship between a surface approach score and examination mark (-55%\*).*

Whilst this relationship is in the expected direction, nothing in the interviews provided a rationale for it. Correlation between mark and surface score was similar for both ACCA papers analysed in the previous chapter, indeed higher and more significant for paper 2.4, so the fact that these students were at the second level does not contribute to an explanation.

Finally, a reflection on the six students who passed:

Two students, Student K and Student D were clearly able to work more quickly than the rest. They also had low surface approach scores, third and fourth lowest respectively. Student D commented '*I am fast I'm always finished before anyone else in an exam*' but even she took almost forty minutes to finish the first case; Student K successfully completed it in less than half an hour. In the pressured environment of an examination they would have been able to

compensate for a lack of deep understanding by a larger, and quicker, quantity of lower level processing. They gained marks of 65% and 60% respectively.

Student F was a highly focused student with a very high deep score and the lowest surface score. She was, by fifteen years, the oldest student in the groups and complained about her lack of both speed and mathematical ability. Since she passed with a mark of 55% it appears that the understanding and focus were able to compensate for the lack of speed. It is tempting to see Student F as the antithesis of Student D and Student K.

Student A and Student G, the only two male students in the group, both gained marks of 50%. Their interviews did not suggest anything that rendered them egregious; Student G, with a very deep score, evidently liked to search out meaning for himself but Student A was not very far from average on all counts. It is at least possible that gender may have been an issue and it would be interesting to know the success rates by gender worldwide, a statistic not maintained by the ACCA.

The final student who passed, Student L, also with a mark of 50% is certainly a puzzle. Her approach to the case was not significantly different from that of her close friends Student O and Student M, discussed above; there was nothing in the way the three of them tackled it that gave any clue as to why Student L should gain an examination mark fifteen percentage points, or around a third, higher than the other two.

The evidence as to why the rest failed is inconclusive. The mean surface approach scores were in the expected direction, 11.4 and 9.8 for the failing and passing groups respectively but the differences were not at all statistically significant. The deep scores of the two groups were almost identical at 14.3 and 14.1. Six of the eleven failing students did not have English as a first language compared with the one passing student. It is possible that the stress of an examination may have been sufficient to render language an issue. However, there are no factors, especially performance in the case studies, which definitively separate the failing and passing students.

The implication of all this is that the ACCA examinations are not a test of underlying understanding of accounting, nor do they relate to approach to learning as measured by ASSIST. They appear to reflect the ability to apply accounting techniques under the pressure of an examination. This may be perceived as an acceptable, and even laudable, conclusion but it leaves as problematic the students' ability to take an overview of the situation facing them.

## **SECTION SIX – CONCLUSIONS**

# Chapter 15 – Conclusions

## 15.1 INTRODUCTION

Central to this dissertation has been an issue of concern to both accounting academics and the accounting profession: students studying for a professional accounting qualification by taking the examinations of a professional accounting body – specifically in this case the ACCA – were much less likely to pass their assessment than students taking equivalent examinations through the medium of a relevant degree at a UK university.

The students involved in this study were typical of part-time accounting students. Their background and age suggest they do not differ significantly from ACCA students the world over and the pass rates they achieved were as good as, and often better than, the worldwide ACCA averages for their subjects. If the findings discussed below are generalisable to other ACCA and undergraduate students – and there is no *a priori* reason why they would not be – they carry significant implications for accounting educators. Further work in this area is strongly recommended to confirm the findings.

The literature review on student learning contained in Section Two of the dissertation suggested that a methodology based on Student Approaches to Learning (SAL) would be the most appropriate for a systematic study of this issue. However, the reservations listed at the end of Chapter Six meant the methodology had to be used with care and adapted to allow for the use of an instrument not designed for a study of this nature by triangulating the ASSIST results with supporting information gained in interviews with the students.

SAL focuses on the relationship between presage factors to learning, which determine students' approach to learning, and the quality of the product of that learning, though the model does not rule out a direct relationship between presage factors and product. The approach to learning scores of the two groups of students as measured by the ASSIST instrument did not correlate with the results they obtained - the ACCA students, with an apparently less surface and partially deeper approach as measured by ASSIST, performed less well in their assessment - though study of the presage factors did reveal a likely explanation for the phenomenon under investigation.

The results obtained are discussed under three headings:

- The effect of the presage factors on students learning. Whether presage factors act directly on learning, or through the intermediary of approach to learning, is not detectable by the methodology employed but this lack of detectability is of little significance since the model does not rule out a direct effect. The effect of presage factors is discussed in section 15.2.
- The relationship between a deep approach to learning, as measured by the ASSIST instrument, and the quality of learning achieved in terms of performance in formal assessment or SOLO classification. This is discussed in section 15.3.
- The relationship between a surface approach to learning, as measured by the ASSIST instrument, and the quality of learning achieved in terms of performance in formal assessment or SOLO classification. This is discussed in section 15.4.

The strategic factor emerging from ASSIST correlated significantly with the deep and did not offer any additional explanatory power. It will not be discussed further here.

Section 15.5 raises some issues concerning generalisability of these findings and section 15.6 draws some conclusions from the results. Section 15.7 is a reflective statement and the chapter closes with section 15.8, which considers future directions for research and makes some recommendations.

## **15.2 PRESAGE FACTORS**

Chapter 11 revealed that, for the most part, the two groups of students being considered were very similar in terms of presage factors. However, section 11.4.2 revealed differences in a small number of areas.

### *15.2.1.1 STUDENT CHARACTERISTICS FACTORS*

The two groups of students proved very similar in terms of personal factors; few differences emerged in background, prior educational factors, interest in, or reason for choosing, accounting as a subject. Both groups had a very strong career focus to their learning, often a liking for mathematics (and accounting), and experience of accounting gained from previous work experience and/or a family link.

The ACCA students were better able to bring understanding gained in their work environment to the classroom, a clear source of difference between the groups. They had a

consistent, but instrumental, view of learning and there was a suggestion (from Table 11.5) they also had a better understanding of their own learning.

One important difference in terms of measured approach to learning was the age of the ACCA students. The only significant correlation with age was that younger male undergraduates had a lower deep score from the ASSIST instrument; on the surface dimension, the signs were in the expected direction – older students had a lower surface score, driven largely by male undergraduates – but differences between the groups were not significant.

#### *15.2.1.2 LEARNING CONTEXT FACTORS*

The groups' expectations of the teacher, both in terms of the kind of teaching and its level, were also very similar. Of prime importance was that the teacher should be approachable, be able to interest students in the subject, and make the subject easy to assimilate. A good teacher can make a subject appear interesting and relevant. For the part-time students in particular, the discipline of being in a classroom was an important contribution to learning.

The one major difference between the groups lay in the type of assessment to which they were subject. On the best interpretation of events, university lecturers focus both course and assessment on those areas they perceive to be of greatest importance to an understanding of the subject. A less charitable interpretation sees the pass rate as a judgement on the lecturer and suggests lecturers set assessments they believe the majority of students will be able to pass. The ACCA has a broad approach to assessment, consistently examining right across the syllabus, thereby making their examinations more difficult to pass. In contrast, the skewness statistics of Chapter Twelve reveal a narrower focus to the university's questions. The ACCA examinations have a pass mark of 50% and no opportunity for reassessment, university examinations a pass mark of 40% - and students are usually allowed a compensated mark of 35% - plus the opportunity for a resit examination. .

### **15.3 DEEP APPROACH TO LEARNING**

The deep factor from ASSIST showed no correlation with performance as measured in formal assessment or level of understanding. The reason is not difficult to understand; there is a discontinuity between deep understanding as measured and how students - and their teachers - interpret deep learning - or rather deep understanding - in the context of management accounting. ASSIST asks questions intended to assess students' intention to take a relational approach to their learning or enthusiasm towards that learning. Example

questions of the former include *'I try to relate ideas I come across to those in other topics or other courses whenever possible.'* and *'When I read, I examine the details carefully to see how they fit in with what's being said.'* and of the latter *'Some of the ideas I come across on the course I find really gripping.'* On this measure both groups of students are relatively deep – deep score exceeds surface. But the students (section 11.5) see 'deep' learning as relating to their ability to process a task within the context of a specific technique and, from the evidence of the examination questions asked, teachers generally share this view. Put simply, the depth of understanding associated with final year undergraduates in management accounting and their ACCA equivalents is about being able to use techniques and explain them, not to relate them to other aspects of the subject or related subjects

A student who has a 'deep' approach as measured may well want to relate her studies to other knowledge domains and even be excited by the subject. Unfortunately, this approach will not help in answering the kind of technique driven questions that crop up in management accounting examination papers at this level. The questions tend to demand a deep understanding of the intra-topic relationships that enable students to actually use the techniques – the focus is on doing and, having done, understanding the implications of what has been done.

In contrast, the depth measured by ASSIST looks for inter-topic relationships, with emphasis on reading (five of the deep scale ASSIST questions ask about books or reading), so the focus is on understanding in the wider context. It is likely that the greater depth shown by the ACCA students in response to the ASSIST questionnaire reflected a genuinely greater interest in the subject but that this interest did not translate into any greater ability to answer questions or develop understanding, both of which demand a facility with computational techniques that the students were struggling to achieve.

The 'deeper' approach students in trying to solve the case studies naturally looked for a technique which would help them solve the problem. They genuinely wanted to take a deeper approach to their studies and as 'good' students looked for the kind of method that had helped them with examinations in the past. The less 'good' students – i.e. those who did not have a deeper approach as measured – were less restricted by an adherence to technique when trying to solve these novel problems, though this capacity to take a broad view could not make up for their lack of technical ability.

If the above hypothesis is correct, further work is necessary to establish whether similar results would be found with other comparable subjects, where computational ability outweighs a more traditional, relational view of the subject at final year undergraduate level.

#### **15.4 SURFACE APPROACH TO LEARNING**

The surface ASSIST factor showed a (negative) correlation with results in formal assessment for the ACCA students but the case studies revealed no corresponding difference in ability. Section 10.2.3 drew attention to some problems in regard to the use of ASSIST with students studying in part-time mode but there is another plausible explanation for this result. As evidenced by performance on the case studies, cognitive factors do not differ greatly within the sample of students tested but differences within the surface factor could be related to affective factors. Some support for this view is that – as discussed in section 13.2 – the *'lack of purpose'* ASSIST sub-scale was the only one that correlated on its own with examination mark. This effect has been previously noted by Clarke (1985). Although *'fear of failure'* is the motivational sub-scale associated with the surface/apathetic factor of ASSIST, containing questions like *'I often seem to panic if I get behind with my work.'* and *'Often I lie awake worrying about work I think I won't be able to do'*, the *'lack of purpose'* sub-scale contains questions such as *'There's not much of the work here that I find interesting or relevant'* and *'I'm not really interested in this course, but I have to take it for other reasons'*, which are clearly about motivation; generally the four factor sub-scales all contain questions that relate, or could be perceived by the students as relating, to both cognitive and affective aspects of study. .

If this hypothesis is correct it means that the surface factor is related to (lack of) examination success because of motivational or other affective aspects of the students' approach to learning, not because they are unable to comprehend the material. This is an important issue and needs further study for confirmation. If true, it would suggest that teachers' efforts should be focused as much on giving the students psychological support as on trying to help their understanding of the material.

#### **15.5 GENERALISABILITY**

A number of issues arose during the study that suggested the students concerned might not be typical of the wider population. These issues have a bearing on possible generalisability of the findings and are noted below:

Whilst by far the majority of ACCA students completed the ASSIST questionnaire, the completion rate by undergraduate students was much smaller. It is likely that failure to complete the questionnaire reflects a lack of interest in the course, itself a symptom of a surface approach. The effect would be to reduce the surface factor score for the undergraduate students actually observed.

The ACCA students were atypical in choosing to study at a university, as opposed to one of the private sector colleges most part-time accounting students attend. The bias is towards a sample comprising more academic students than the norm, who prefer to study in a university environment, thus in part explaining the relatively high deep learning scores of this group.

Selection of the sample of students for the first interview is described in Chapter Nine. The small number of students who volunteered for interview leaves little room for bias in their selection but it is likely that students who volunteered were not typical of the general population of students.

Some bias exists in the sample for the case study interviewees, with a higher proportion of females than existed in the class. This bias is marginal - for both groups around two-thirds of the class attended for interview - and the consistency of response noted in Chapter Fourteen suggests this bias did not affect the results.

## **15.6 OVERALL CONCLUSION**

In terms of presage factors, the ACCA students were able to make use of their work environment to support their learning and were older than the undergraduates. These factors would suggest the product of their learning should be greater success in assessment. One factor mitigates against this conclusion, assessment method; ACCA students faced a threatening assessment regime with a single examination based broadly across the syllabus sat in an unfriendly environment; undergraduates sat examinations set by their teacher with an element of coursework and the possibility of resitting examinations after initial failure. It might be argued that this is a rather obvious conclusion but if presumption of equality cannot be made about assessment, the rationale for giving accounting students exemptions from professional examinations must be called into question.

The deep approach to learning factor as measured by ASSIST did not relate to the students' success in assessment. Very likely this was because final year undergraduates - and their

ACCA counterparts - are not generally working or being assessed at higher than a unistructural level. Even those students who sought to attain a deeper understanding of the subject were committed to a technique based approach. Their desire to deep learn was insufficient to differentiate them from their colleagues at this level and their focus on technique could actually be a disadvantage in some questions - notably the first, compulsory question on paper 2.4 - that demand a more relational view.

The surface ASSIST factor did relate (negatively) to assessment success but not to understanding. Plausibly this was down to the affective aspects of the surface factor though further work would be needed for confirmation.

### **15.7 REFLECTIVE STATEMENT**

In retrospect this dissertation tried to cover too much ground. Student learning is a very wide area of study and focusing on the material that forms Chapters Thirteen and Fourteen of this dissertation would have made for a tighter and more concise study. The first round of interviews with students, though interesting, does not contribute as significantly to the existing body of knowledge about student learning as the later material. To the extent that this part of the study did prove of importance, it was because of issues surrounding the ASSIST instrument. Asking the students directly about their interpretation of the ASSIST questions would have been a useful addition to the study.

In addition to the factors noted above, the use of ASSIST presented two other difficulties:

It was designed as a diagnostic tool to aid student learning not as a predictive one. Although it is clear from the literature that the psychological instruments have been very widely used to assess students' approach to learning - and in many cases related to performance in assessment - the inability to correlate approach and product on this occasion presented a considerable difficulty.

It was also designed to be used in relation to a specific learning situation. The approach scores of the students who completed the case studies were computed from the questionnaire administered in the context of their course. It is possible that their approach to the separate task which was the case study may have been quite different, though the first case study was presented as an element of revision on their course.

### 15.7.1 A PERSONAL REFLECTION

On a personal note: Marton, Dall’Alba, and Beaty’s (1993) highest conception of learning was ‘*changing as a person*’. The difference, having completed a major piece of research in terms quality of understanding achieved, of the effort involved in continuing, long-term commitment to a relatively small area of study, and of working at an appropriate level of analysis, was profound, for this individual at least, on both a personal and an academic level. Like any traveller back from a journey, nothing will ever be quite the same again.

The implications for accounting education are also significant. Many universities now insist on new academics possessing doctorates. For professionals, who spend the years immediately after graduating, when other academics gain doctorates, in gaining the professional qualification, this represents a substantial extra achievement and explains some of the problems currently being found in filling academic accounting posts. But most academics would support the idea that having experienced the discipline of carrying out a major research study is an important attribute for a university lecturer.

## 15.8 FUTURE DIRECTIONS AND RECOMMENDATIONS

The issues raised here and appropriate for further research can be subsumed under three headings: those concerning part-time accounting students, those centred on accounting education more generally, and the use of SAL in this type of investigation.

### 15.8.1 PART-TIME ACCOUNTING STUDENTS

The key difference between the two groups of students studied here lies in the type of assessment. If the ACCA’s papers genuinely provide a sterner test than internal university examinations, the way in which university graduates are granted exemptions from ACCA papers should be of great concern to the professional accounting bodies and further confirmatory studies are necessary. Should further research support the conclusions reached here, the way university graduates are granted exemptions by the professional accounting bodies should be urgently reviewed.

The relationship between courses leading to professional qualifications and university degree courses has never been wholly clarified and needs further attention. Haggis (2003) raised the problem of a lack of understanding by full-time

students of the norms and goals of higher education; this concern applies *a fortiori* to part-time students.

The final case studies were not attempted with undergraduate students. It would be of interest to try to assess the depth of understanding achieved by undergraduate accounting students on the same cases.

This is the first in-depth piece of work on the approaches to learning of professional accounting students. Further work on other professional groups would be useful to compare results.

### 15.8.2 ACCOUNTING EDUCATION

The link between theory and practice - between understanding and being able to do - is a familiar problem for academics engaged in any vocational subject. It is clear from several of the students' comments that they perceive practice as important as a pathway to theory and that theory itself is to be learned and regurgitated, not a complex set of wider inter-connections with related topics - accounting is a practical subject where ability to 'do' is the most important aspect. Nothing in the SOLO taxonomy or the hierarchy of Bloom's (1956) cognitive domain distinguishes sufficiently between the intra-subject complexity arising from building more intricate models within a strictly mechanistic world view and the creation of complex inter-subject models which are essentially non-mechanistic. Synthesis, evaluation, and expertise are all possible both within and between domains of knowledge. Chapter Twelve demonstrated that examination questions most often tested students' ability to explain the implications of a technique they had used as opposed to explaining the technique in context. It became clear from the tenor of many students' responses that extension within a schema would be their interpretation of 'deep' learning. To the extent that there is confusion within the profession about what precisely constitutes an appropriate depth of understanding, we can hardly expect the students to do better.

The study has implications for the training of accountants. With the performance of accountants suffering increased criticism, the inability of these students to take a broad view of their subject creates concern. Evidently students are being forced by the nature of their assessment to take a technique-based approach but even with a different assessment regime - for example one more case-study based - evidence

would be needed to show deeper learning would necessarily result. Moreover, management accounting itself is being taught within a paradigm that many would argue to be inappropriate in a rapidly changing environment. A better approach might be for training to be spread throughout an individual's career so that periods of academic study were reinforced by periods in practice.

The parallels between these students and those of Lucas (2001) are revealing. Her first-year students split between those taking a global (deep) view of the subject and those taking a format-based (surface) approach. If these students are Lucas's four or five years later in their career, what happened? Have the deep students taken a different path, have they been forced to change their approach in response to a different assessment regime, or are those students still there, registering as deep on the ASSIST questionnaire but unable to translate their intentions into genuine deeper learning?

If the education received by these students does not lead to a deep understanding of accounting, perhaps it does provide a platform on which that understanding can develop. Interviewing a group of qualified accountants would reveal whether their understanding had developed over time.

### 15.8.3 THE USE OF STUDENT APPROACHES TO LEARNING

Using SAL in this study proved problematic because of the discontinuity noted above between the idea that deep learning is equivalent to at least a relational approach to study on the one hand and the relatively uni-structural, or at best multi-structural, approach being pursued at final-year university level in this very quantitative subject. Further work is needed to assess whether this is a general problem in quantitative fields of study and, if so, some adaptation of the instruments used to detect approach to learning is advisable for use in these subject areas.

## **GLOSSARY**

## GLOSSARY OF TERMS

3- P's	-	Presage, Process, Product model
AAT	-	Association of Accounting Technicians
ACCA	-	Association of Chartered Certified Accountants
AM	-	Achieving Motive (scale on SPQ)
AS	-	Achieving Strategy (scale on SPQ)
ASI	-	Approaches to Study Inventory
ASQ	-	Approaches to study Questionnaire
ASSIST	-	Approaches and Study Skills Inventory for Students
CAT	-	Certified Accounting Technician
CIMA	-	Chartered Institute of Management Accountants
CIPFA	-	Chartered Institute of Public Finance and Accounting
CNAA	-	Council for National Academic Awards
CVP	-	Cost-Volume-Profit (Break-Even) Analysis
ELM	-	Experiential Learning Model
HEI	-	Higher Education Institution
ICAEW	-	Institute of Chartered Accountants of England and Wales
ICAI	-	Institute of Chartered Accountants of Ireland
ICAS	-	Institute of Chartered Accountants of Scot land
ILS	-	Inventory of Learning Styles
LSI	-	Learning Style Inventory
LSQ	-	Learning Styles Questionnaire
NPV	-	Net Present Value
PAF	-	Principal Axis Factors
PCA	-	Principal Components Analysis
RASI	-	Revised Approaches to Study Inventory

SAL	-	Student approaches to learning
SOLO	-	Structure of Observed Learning Outcomes
SPQ	-	Study Process Questionnaire

## **APPENDICES**

## **APPENDIX 1**

### **The ASSIST Questionnaire**

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A S S I S T

## Approaches and Study Skills Inventory for Students

(Short version)

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This questionnaire has been designed to allow you to describe, in a systematic way, how you go about learning and studying. The technique involves asking you a substantial number of questions which overall to some extent to provide good overall coverage of different ways of studying. Most of the items are based on comments made by other students. Please respond truthfully, so that your answers will accurately describe your actual ways of studying, and work your way through the questionnaire quite quickly.

---

### Background information

Name or Identifier ..... Age ..... years Sex M / F

University or College ..... Faculty or School .....

Course ..... Year of study .....

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### A. What is learning?

*When you think about the term 'LEARNING', what does it mean to you?*

*Consider each of these statements carefully, and rate them in terms of how close they are to your own way of thinking about*

	<i>Very close</i>	<i>Quite close</i>	<i>Not so close</i>	<i>Rather different</i>	<i>Very different</i>
a. Making sure you remember things well.	5	4	3	2	1
b. Developing as a person.	5	4	3	2	1
c. Building up knowledge by acquiring facts and information.	5	4	3	2	1
d. Being able to use the information you've acquired.	5	4	3	2	1
e. Understanding new material for yourself.	5	4	3	2	1
f. Seeing things in a different and more meaningful way.	5	4	3	2	1

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## B. Approaches to studying

The next part of this questionnaire asks you to indicate your relative agreement or disagreement with comments about studying again made by other students. Please work through the comments, giving your immediate response. In deciding your answers, think in terms of this particular lecture course. It is also very important that you answer all the questions: check you have.

5 means agree (✓)      4 = agree somewhat (✓?)      3 = disagree somewhat (x?)      2 = disagree (x)

Try not to use 3 = unsure (??), unless you really have to, or if it cannot apply to you or your course.

	✓	✓?	??	x?	x
1. I manage to find conditions for studying which allow me to get on with my work easily.	5	4	3	2	1
2. When working on an assignment, I'm keeping in mind how best to impress the marker.	5	4	3	2	1
3. Often I find myself wondering whether the work I am doing here is really worthwhile.	5	4	3	2	1
4. I usually set out to understand for myself the meaning of what we have to learn.	5	4	3	2	1
5. I organise my study time carefully to make the best use of it.	5	4	3	2	1
6. I find I have to concentrate on just memorising a good deal of what I have to learn.	5	4	3	2	1
7. I go over the work I've done carefully to check the reasoning and that it makes sense.	5	4	3	2	1
8. Often I feel I'm drowning in the sheer amount of material we're having to cope with.	5	4	3	2	1
9. I look at the evidence carefully and try to reach my own conclusion about what I'm studying.	5	4	3	2	1
10. It's important for me to feel that I'm doing as well as I really can on the courses here.	5	4	3	2	1
11. I try to relate ideas I come across to those in other topics or other courses whenever possible.	5	4	3	2	1
12. I tend to read very little beyond what is actually required to pass.	5	4	3	2	1
13. Regularly I find myself thinking about ideas from lectures when I'm doing other things.	5	4	3	2	1
14. I think I'm quite systematic and organised when it comes to revising for exams.	5	4	3	2	1
15. I look carefully at tutors' comments on course work to see how to get higher marks next time.	5	4	3	2	1
16. There's not much of the work here that I find interesting or relevant.	5	4	3	2	1
17. When I read an article or book, I try to find out for myself exactly what the author means.	5	4	3	2	1
18. I'm pretty good at getting down to work whenever I need to.	5	4	3	2	1
19. Much of what I'm studying makes little sense: it's like unrelated bits and pieces.	5	4	3	2	1
20. I think about what I want to get out of this course to keep my studying well focused.	5	4	3	2	1
21. When I'm working on a new topic, I try to see in my own mind how all the ideas fit together.	5	4	3	2	1
22. I often worry about whether I'll ever be able to cope with the work properly.	5	4	3	2	1
23. Often I find myself questioning things I hear in lectures or read in books.	5	4	3	2	1
24. I feel that I'm getting on well, and this helps me put more effort into the work.	5	4	3	2	1
25. I concentrate on learning just those bits of information I have to know to pass.	5	4	3	2	1
26. I find that studying academic topics can be quite exciting at times.	5	4	3	2	1
27. I'm good at following up some of the reading suggested by lecturers or tutors.	5	4	3	2	1
28. I keep in mind who is going to mark an assignment and what they're likely to be looking for.	5	4	3	2	1
29. When I look back, I sometimes wonder why I ever decided to come here.	5	4	3	2	1
30. When I am reading, I stop from time to time to reflect on what I am trying to learn from it.	5	4	3	2	1

	√	√?	??	x?	x
31. I work steadily through the term or semester, rather than leave it all until the last minute.	5	4	3	2	1
32. I'm not really sure what's important in lectures so I try to get down all I can.	5	4	3	2	1
33. Ideas in course books or articles often set me off on long chains of thought of my own.	5	4	3	2	1
34. Before starting work on an assignment or exam question, I think first how best to tackle it.	5	4	3	2	1
35. I often seem to panic if I get behind with my work.	5	4	3	2	1
36. When I read, I examine the details carefully to see how they fit in with what's being said.	5	4	3	2	1
37. I put a lot of effort into studying because I'm determined to do well.	5	4	3	2	1
38. I gear my studying closely to just what seems to be required for assignments and exams.	5	4	3	2	1
39. Some of the ideas I come across on the course I find really gripping.	5	4	3	2	1
40. I usually plan out my week's work in advance, either on paper or in my head.	5	4	3	2	1
41. I keep an eye open for what lecturers seem to think is important and concentrate on that.	5	4	3	2	1
42. I'm not really interested in this course, but I have to take it for other reasons.	5	4	3	2	1
43. Before tackling a problem or assignment, I first try to work out what lies behind it.	5	4	3	2	1
44. I generally make good use of my time during the day.	5	4	3	2	1
45. I often have trouble in making sense of the things I have to remember.	5	4	3	2	1
46. I like to play around with ideas of my own even if they don't get me very far.	5	4	3	2	1
47. When I finish a piece of work, I check it through to see if it really meets the requirements.	5	4	3	2	1
48. Often I lie awake worrying about work I think I won't be able to do.	5	4	3	2	1
49. It's important for me to be able to follow the argument, or to see the reason behind things.	5	4	3	2	1
50. I don't find it at all difficult to motivate myself.	5	4	3	2	1
51. I like to be told precisely what to do in essays or other assignments.	5	4	3	2	1
52. I sometimes get 'hooked' on academic topics and feel I would like to keep on studying them.	5	4	3	2	1

### C. Preferences for different types of course and teaching

5 means definitely like (√), 4 = like to some extent (√?), 3 = dislike to some extent (x?), 2 = definitely dislike (x)  
 Try not to use 3 = unsure (??), unless you really have to, or if it cannot apply to you or your course.

	√	√?	??	x?	x
a. lecturers who tell us exactly what to put down in our notes	5	4	3	2	1
b. lecturers who encourage us to think for ourselves and show us how they themselves think	5	4	3	2	1
c. exams which allow me to show that I've thought about the course material for myself	5	4	3	2	1
d. exams or tests which need only the material provided in our lecture notes	5	4	3	2	1
e. courses in which it's made very clear just which books we have to read.	5	4	3	2	1
f. courses where we're encouraged to read around the subject a lot for ourselves.	5	4	3	2	1
g. books which challenge you and provide explanations which go beyond the lectures.	5	4	3	2	1
h. books which give you definite facts and information which can easily be learned.	5	4	3	2	1

Finally, how well do you think you have been doing in your assessed work overall, so far?

Please rate yourself objectively, based on the grades you have been obtaining

Very well	Quite Well	About average	Not so well	Rather badly
9	8	7	6	5
				4
				3
				2
				1

Thank you very much for spending time completing this questionnaire: it is much appreciated.

## **APPENDIX 2**

### **Further Details of Development of the Instruments and Their Relation to Performance**

#### ***Further Details of Development of the ASI***

Entwistle and Ramsden (1983) spent a one-year period interviewing, statistically analysing, producing questionnaires, and then iterating the process. They were able to produce both a psychological inventory and an associated questionnaire that were pilot tested on 248 first year students from a range of disciplines. No details were provided about how these students were chosen. The 60 extreme scoring students (initially 72 were chosen but only 60 came for further interview) were subjected to ten hours of tests over six sessions and a *'learning experiment involving the reading of three short articles'* (op.cit. p31).

This first attempt identified 120 items statistically linked together in clusters and also a conceptual analysis based on the literature: *'It was soon clear that the 'deep approach to studying' and 'organized, motivated study methods' were major dimensions and that a third factor brought together surface processing with fear of failure and syllabus-boundedness'* (op.cit p36)

There was an evident similarity with work done by Biggs in Australia (Biggs, 1976, 1979) and some of the scales used by Biggs were incorporated into the next version of the questionnaire, tested in the study's second phase on 767 first year students in a range of disciplines. At this stage there were four factors: a deep approach to study (having an orientation to study that focused on underlying meaning); a surface approach (having an orientation focused on reproducing material learned); organised study methods (having an orientation focused on achieving success in assessment), and stable extraversion. After some subsequent refinement, in the final research version the fourth factor became 'styles and pathologies of learning' encompassing: comprehension learning, operation learning, globetrotting, and improvidence<sup>20</sup> (Table A1-1).

The result was an inventory known as the Approaches to Study Instrument (ASI) which was tested on 2208 second year students in 66 university departments, covering a range of subject areas. No details were provided about how the students were selected or how the questionnaire was administered. Although factors emerging from the factor analysis confirmed prior expectations, the link with performance was much less clear. The direction of correlation with academic performance (based on the students' self assessment) was in the expected direction for each of the sixteen sub-scales but correlations for the whole sample were low, varying between 4% and 32% and the overall correlation was significant only at the 6% level (no details were provided of significance of the sub-scales' correlations with

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<sup>20</sup> Some sources refer to 'methodologies' rather than 'pathologies' but the latter is the original.

performance). Splitting the sample into subjects areas (arts, science and social science) reduced the significance level to between 9 and 12%.

<i>ORIENTATION</i>	<i>MEANING</i>
<b>Meaning</b>	
Deep approach	Active questioning in learning
Inter-relating ideas	Relating to other parts of the course
Use of evidence and logic	Relating evidence to conclusions
Intrinsic motivation	Interest in learning for learning's' sake
<b>Reproducing</b>	
Surface approach	Preoccupation with memorising
Syllabus boundedness	Relying on teachers to define learning tasks
Fear of failure	Pessimism and anxiety about academic outcomes
Extrinsic motivation	Interest in courses for the qualifications they offer
<b>Achieving</b>	
Strategic approach	Awareness of the implications of academic demands made by teachers
Disorganised study methods	Unable to work regularly or effectively
Negative attitudes to studying	Lack of interest and application
Achievement motivation	Competitive and confident
<b>Styles and Pathologies</b>	
Comprehension Learning	Readiness to map out subject area and think divergently
Globetrotting	Over-ready to jump to conclusions
Operation learning	Emphasis on facts and logical analysis
Improvidence	Over-cautious reliance on detail

**Table A2-1 - The Four Original ASI Scales Split into Orientation and Meaning**

Following further work by the Open University, the sub-scales were re-assessed (Morgan, Gibbs, and Taylor, 1980) and revised to become: Meaning (Deep), Reproducing (Surface), Achieving, Non-academic. Biggs suggested the first three of these were linked with motivations: Intrinsic, Extrinsic, and Achievement.

Watkins (1983a) mailed the ASI to students enrolled on 'seven of the largest senior courses' in the Faculties of Arts, Science and Economics at the Australian National University, achieving a 70% response rate of 292 students. Watkins questioned the relationship between learning style and the corresponding pathologies, only the meaning and reproducing factors emerged clearly from the data. The correlations with achievement were not generally high or significant but the deep approach had an overall correlation with achievement of 16%\*\* and intrinsic motivation 24%\*\* . Most of the significant correlations were negative – surface approach, syllabus boundedness, disorganised study methods, and negative attitudes to studying.

Clarke (1985) used the ASI to study medical students in years one, three and five of their course. All students were invited to complete a questionnaire, missing students were followed up by letter, and an 84% response rate (153 students) achieved.

Clarke again found the expected factors. He also noted that the most consistent (negative) predictor of academic success lay in the affective domain: negative attitudes to study disorganised approach, rather than in cognitive aspects.

Other studies followed: Harper and Kember (1986a) on 779 students in Australia was the first to include distance learning students and confirmed a four-factor solution with at least the first two '*similar to .. all known previous studies*'; Meyer and Parsons (1989) tested 1189 students in South Africa and '*confirmed the conceptual integrity of the majority of the subscales*' though considered '*strategic approach*', '*achievement motivation*', and '*operation learning*' as secondary components. These were followed by many others over the next decade - the Edinburgh University website<sup>21</sup> lists in excess of 150 produced prior to the year 2000 - as the ASI rapidly became a standard instrument for educational researchers.

The ASI went through a series of revisions: a 60-item, 15 scale version developed in 1992 measured five dimensions: Deep Approach, Surface Approach, Strategic Approach, Apathetic Approach, and Academic Aptitude. A reduced version was produced in 1994 with 38 items in 15 scales; the five dimensions were Deep Approach, Surface Approach, Strategic Approach, Lack of Direction, and Academic Self-Confidence. The Revised Approaches to Study inventory (RASI; Entwistle and Tait, 1996) was a later development using 44 items and 15 scales and intended as a remedial tool. It was designed to be delivered on a computer (using a program called PASS) and, following administration, gave students their results as a 3-dimensional plot with the intention of enabling them to take corrective action.

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<sup>21</sup> [www.tla.ed.ac.uk/etl/questionnaires/bibliography/ASI.html](http://www.tla.ed.ac.uk/etl/questionnaires/bibliography/ASI.html)

## *The RASI*

The RASI was influenced by other inventories that had been produced since the ASI's inception, particularly the SPQ and ILP. There was some uncertainty from Pask's work as to whether comprehension learning and operation learning were styles or cognitive processes. In the ASI there was a conceptual similarity between comprehension learning and relating ideas and operation learning and use of evidence '*with the disappearance of the defining strategies defined by Pask, it was decided also to drop the pathologies*'. (Tait and Entwistle, 1996, p 105). It was also intended to recognise the importance of active learning, the distinction between fragmentation and memorisation within the surface approach, and reflection within the deep approach and to incorporate within each subscale an intention, a study process, and a motivation (Tait, Entwistle and McCune, 1998). Thus the RASI's five scales combined both an orientation and an approach to study:

Meaning orientation – deep approach

Reproducing orientation – surface approach

Achieving orientation – strategic approach

Non-academic orientation – lack of direction

Self-confidence in ability – academic self-confidence, metacognitive awareness

Since the ASI had been introduced, successive changes gradually lost the more obvious strategic elements, which became concerned with organised study and directed effort. The original strategic factor was now covered by two scales, one indicating *organised studying* (including time management), and the other *effort management* (including concentration).

Tait and Entwistle (1996) initially tested the 44-item RASI on 640 students of biology/computing/engineering/psychology and then followed it up with a 38-item version given to 345 first year students in three departments of science and social science. The initial test displayed a four-factor pattern and the second three factors but clearly displaying the sub-scales grouped under the five variables shown above. It is not clear from Tait and Entwistle's paper whether the testing was paper based or whether students used the computer programme.

Sadler-Smith (1996<sup>22</sup>) gave the new questionnaire to 245 undergraduate business studies students. It was given in class time and presumably all, or nearly all, the students responded

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<sup>22</sup> Presumably a paper-based version

though Sadler-Smith gives no indication of response rate. Analysis of the responses successfully reproduced the five factors identified by Tait and Entwistle though '*lack of direction*' had an unacceptably low (0.29) Cronbach's alpha reliability coefficient. Correlation with performance was poor; compared with three individual items of assessment and an aggregate, only the deep factor was valid at the 1% level - for the aggregate ( $r=25\%$ ) and for the accounting students ( $r=46\%$ ). For all other subject areas and types of assessment correlations were very low and, almost all, not statistically valid even at the 5% level.

Sadler-Smith and Tsang (1998) used the RASI with second year business undergraduates, 225 in the UK and 183 in Hong Kong; the groups of students were described '*opportunity samples*'. This time only the strategic scale displayed reliability ( $\alpha>0.7$ ) and three factors emerged labelled deep, surface, and strategic. Correlation with academic performance was again very poor, with low correlation coefficients throughout; only two sub-scales showed greater than 1% reliability and those only in the UK and with the aggregate of assessments. No Hong Kong scales correlated at this level and only two at the 5% level..

### ***ASSIST***

The RASI studies had suggested that further work could be carried out to eliminate items and subscales not stable across disciplines and institutions. Monitoring effectiveness was being seen as of increasing importance to learning so it was also desired to incorporate metacognition under this heading. The resulting 52 item inventory became known as the Approaches and Study Skills Inventory for Students (ASSIST). It was tested on a sample of 1231 students – mostly first year – across a range of universities and disciplines (Tait, Entwistle, and McCune, 1998). The six universities were chosen to represent the range of types in the UK: ancient, post-Robbins, technological, and new. Tait *et al.* gave no details about how the questionnaires were distributed nor about response rates. The '*factor analysis indicated there was empirical justification for the substantial majority of the subscales*' (p268).

The deep approach was associated with an intrinsic orientation and surface apathetic with a feeling that prior knowledge was inadequate. Tait *et al.* found a highly significant correlation on all subscales with self-rating of performance but real performance data, based on average performance taken over completed modules, was available for 649 students and revealed no correlation between performance and a deep approach, though a high correlation persisted with the surface and strategic approaches and sub-scales.

A follow up study in the UK and South Africa (Entwistle, Tait, and McCune, 2000) confirmed that ASSIST was stable across institutions not located within the United Kingdom. South African students gained similar scores to those in the UK and the same three factors emerged.

### ***Further Details of Development of the SPQ***

The first version of the SPQ was tested by Hattie and Watkins (1981) on 255 first year students at the University of New England in Australia and 173 freshmen at the University of San Carlos in the Philippines. The Australian survey was by mail and the Philippine handed out in-class. No figures are provided for completion rates.

The Australian sample could be interpreted with two, three, or six factors. The six factor solution matched Biggs' utilising, internalising, and achieving each with a motive and strategy. The Philippine results only gave a two factor solution, motive and strategy. The reliability factors were '*very adequate for the Australian students and fairly encouraging for the Filipinos*' (p242); Hattie and Watkins concluded the SPQ '*may not be appropriate for use with Filipino students*' (p243).

Biggs (1982) represents a test on 1016 college and university students from fifteen institutions (five universities and ten colleges) spread across arts, education, and science and across all years of study. Questionnaires were handed out at the beginning of a class and completed ones collected at the next. Large numbers of questionnaires were sent to each institution involved so it was impossible to assess completion rates or to have any evidence as to the randomness of the samples. Three highly significant factors emerged, now given the names surface, deep, and achieving, each with an associated motive and strategy:

Surface motive (instrumental) – surface strategy (reproductive)

Deep motive (intrinsic) – deep strategy (meaningful)

Achieving motive (based on competition and ego enhancement) – strategy self-organisation

The achieving approach related to the ego enhancement students get from achieving high grades (Biggs 2001). Biggs (1987) described the achieving approach as follows: '*Achieving Motive (AM) is based on competition and ego enhancement: (to) obtain highest grades, whether or not (the) material is interesting. Achieving Strategy (AS) is based on organizing one's time and working space: behave as a model student.*' (p11).

The SPQ's final version (Biggs, 1982) had 42 items and six subscales, three – then called utilizing, internalizing, and achieving but later termed deep, surface, and achieving '*to achieve greater consistency with other writers*' (Beattie, Collins, and McInnes, 1997) – separated into motivation and strategy.

Watkins (1982b) employed the ASI with 540 Australian National University students. The sample represented a 60% response from questionnaires mailed to all first year students in the Faculties of Arts, Science and Economics in their third term. Watkins only identified two factors clearly. Correlations between first-year grades and ASI sub-scales followed the same pattern as Entwistle and Ramsden's but were approximately half the latter's values and were not statistically significant overall. Only a subscale termed surface/confusion was valid at the 1% level with a value of -26%.

Eley (1992) administered the SPQ to 152 students, in a range of disciplines including accounting. He concluded that a deeper approach to learning could be fostered by a more supportive learning environment both between courses and for individual students within a course but there was nevertheless a wide range of approaches within each course unit '*variabilities shown by individual students ...seem generally quite small in magnitude*' (p250) and '*the relationship between course perceptions and adopted study approaches seems not so strong as to ensure that changes in the former lead consistently to sympathetic changes in the latter*' (p251)

Burnett and Dart (1997) sampled around 2,000 students from two Australian universities and concluded that '*results of this study provide strong support for the construct validity and reliability of the three approach scales contained in the SPQ*' (p 98) but suggested that three scales (i.e. surface, deep, and achieving) should be used in preference to six sub-scales. They also noted that not all the individual scale items '*loaded on the factors they were hypothesised to measure*' (*op. cit.*, p 98).

Burnett and Dart (2000) reviewed nine studies of the SPQ covering 10,500 students in half a dozen countries and Watkins (1998) 4,400 students in ten countries. Although the studies were generally supportive, they were not consistent in their approach to the number of scales involved. Biggs assumed the six scales described above (surface, deep, and achieving each split into motive and strategy) and considered these as constituting three factors. Some of the studies had imposed three or six scales on the data; others had allowed factors to emerge from the data. Watkins (2001) commented that '*All but 13 of the 84 alpha coefficients*

*exceeded 0.5; a magnitude considered acceptable for a research instrument...but well below the level required for important academic decisions about an individual student', (p171). Watkins' comment was based on Nunnally (1978) 'Only if the reliability is above .80, and preferably above .90, is it possible for tests to be highly valid assessments of performance' (p99).*

Table A1-2 provides a comparison between the various versions of the ASI and the SPQ and shows how the scales have developed over time. Note how within the ASI series, in progressing from ASI through RASI to ASSIST, the styles and pathologies (methodologies) scale has reduced and finally disappeared. .

<b>ASI</b>	<b>RASI</b>	<b>ASSIST</b>	<b>SPQ</b>
<i>Meaning Orientation</i>	<i>Deep approach</i>	<i>Deep Approach</i>	<i>Deep Strategy</i>
Deep Approach	Intention to Understand	Seeking Meaning	
Relating Ideas	Relating Ideas		
Comprehension Learning		Relating Ideas	
Use of Evidence	Use of Evidence	Use of Evidence	
Operation learning			
<i>Intrinsic Motivation</i>	<i>Active Interest</i>	<i>Interest in ideas</i>	<i>Deep Motive</i>
<i>Reproducing Orientation</i>	<i>Surface Approach</i>	<i>Surface Apathetic Approach</i>	<i>Surface Approach</i>
Surface Approach	Intention to Reproduce		
Syllabus-Boundedness		Syllabus Boundedness	
	Unrelated Memorising	Unrelated Memorising	
Fear of Failure	Passive Learning	Lack of Purpose	
<i>Extrinsic Motivation</i>	<i>Fear of Failure</i>	<i>Fear of failure</i>	<i>Surface Motive</i>
<i>Achieving Orientation</i>	<i>Strategic Approach</i>	<i>Strategic Approach</i>	<i>Achieving Strategy</i>
Strategic Approach	Study organisation	Organised Study	
Disorganised Studying	Time Management	Time Management	
Negative Attitudes	Alertness to Assessment	Monitoring Effectiveness	
<i>Achieving Motivation</i>	<i>Intention to Excel</i>	<i>Achieving Motive</i>	<i>Achieving Motive</i>
<i>Styles and Pathologies</i>	<i>Apathetic Approach</i>		
Comprehension Learning	Lack of Interest		
Globetrotting			
Operation Learning			
Improvvidence	<i>Lack of Direction</i>		

**Table A2-2 – A comparison of the three versions of the ASI: ASI, RASI, and ASSIST, showing how the scales and sub-scales have developed over time, and the SPQ (Author)**

### **APPENDIX 3**

#### **Full List of Management Accounting Topics**

## ***Full List of Topics***

### **Departmental Organisation**

Organisation of Dept

Book-Keeping

### **Organisation Types**

Non-Profit

Non-Manufacturing

Health

Organisational objectives

Transport

Retail

### **Information Systems**

MIS

Information/Presentation

Data Entry

Data Processing

### **Management Accounting**

Role of

And Cost Accounting

And Financial Accounting

### **Management Decisions**

Objectives

Strategy

Planning

Monitoring

Controlling

Decision Making

Financial Models

## **Long-Term Decisions**

### *Techniques*

NPV

IRR

ARR

Payback

Discounted payback

NPV+IRR

Interest Computation

Comparative Investment Decisions

### *Risk and Uncertainty*

Sensitivity

Capital Rationing

Tax

Annual Equivalents

General

## Short-Term Decisions

### *Cost Accounting (Products and Operations)*

#### *Traditional Costing Systems*

Cost Allocation

Absorption

Marginal

Absorption + Marginal

Job/Batch

Contract

Process

Service

Preparation

Uniform

#### *Cost Types*

Labour

Material

EOQ

Overhead

Cost Functions/behaviour

Fixed and Variable

Direct and Indirect

Cost Units

Cost Centre

### *Decision Techniques*

CVP Analysis

Limiting Factors

Relevant Costing

Pricing

Contribution

Linear Programming

Deprival Value

## ***Statistical***

Time Series

Price Indices

Inflation

Decision Trees

Expected Value

Regression

High-Low

Flexed

Zero Based

Top Down/Bottom

Up

Periodic/continuous

Scattergraph

## ***Budgets***

Objectives

Strategy and

Tactics

Motivation

Preparation

Cash

Flexed

Evaluation

Behavioural

Responsibility

Accounting

Budgetary Control

Budget Slack

## ***Standard Costing***

Preparation of Standards

## ***Variance Analysis***

Material

Labour

Overhead

Sales

Reconciliation with profit

Calendar

## ***Performance Management***

Residual Income

ROI

Profit Statement Preparation

Trading Performance

Contribution Statement

Performance Analysis

Objectives

Introduction of new machine

Strategic Analysis

Performance measurement

Divisional Performance

Minimax etc

Cost Control

Qualitative Measures

New Product

Closing Hotel

### ***Divisionalisation***

Divisionalisation

Transfer pricing

### ***Advanced Costing Systems***

ABC

JIT

TQM

Target Costing

Throughput Acct

Balanced scorecard

Lifecycle costing

Target Costing

### ***Strategic Management Accounting***

Relevance of mgt acctg info

SMA in orgs strat framework

External SM Info

Internal SM Info

Learning curves

Tax and Cost Acctg

Various

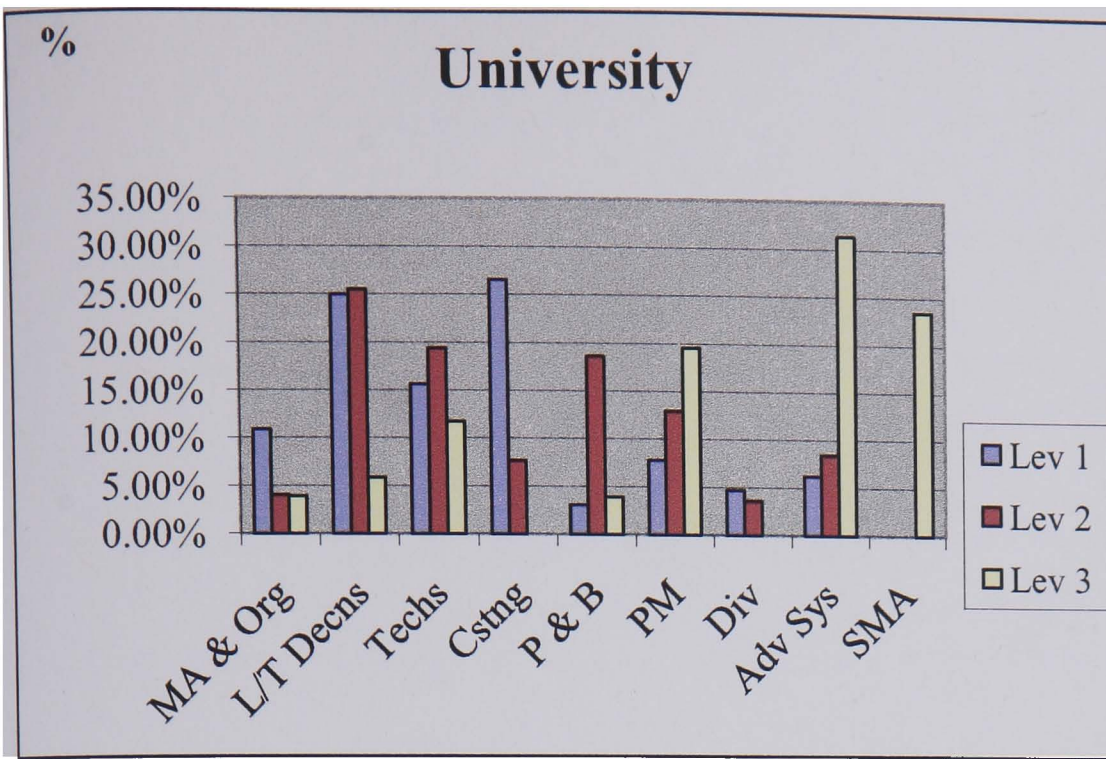
## **APPENDIX 4**

### **Breakdown of Examination Topics**

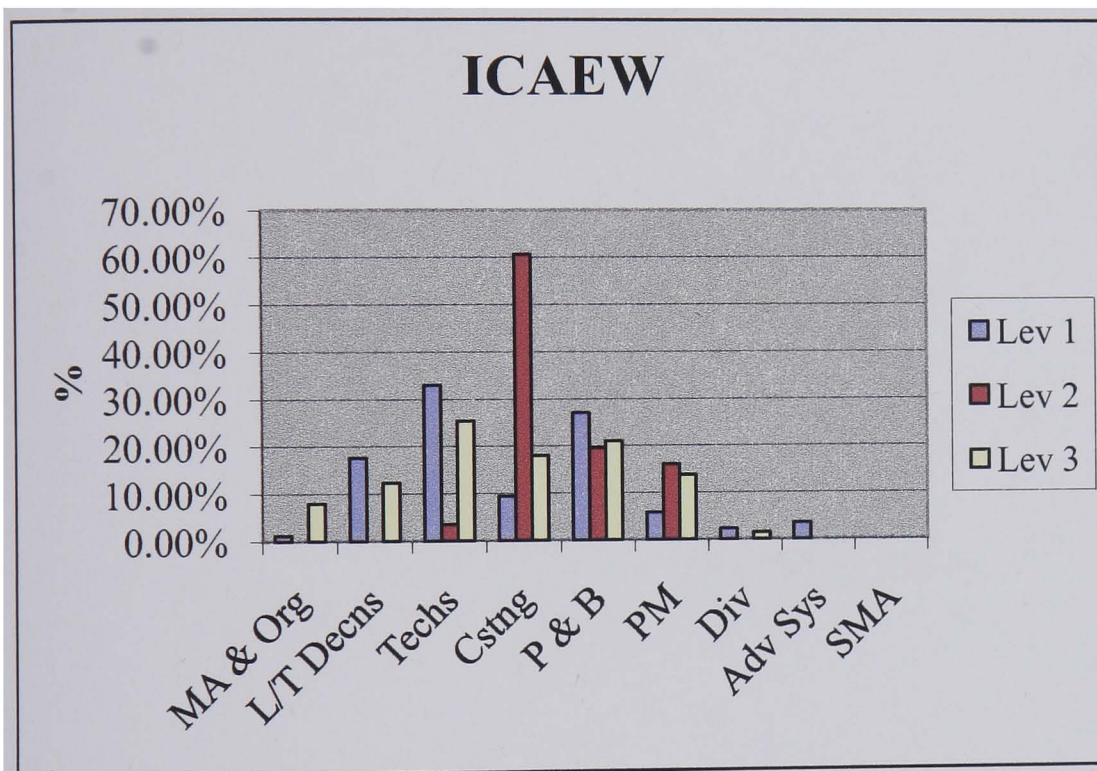
<i>University</i>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
MA and the Organisation	10.94%	4.05%	3.92%
Long Term Decisions	25.00%	25.51%	5.88%
Techniques	15.63%	19.43%	11.76%
Costing	26.56%	7.69%	0.00%
Planning and Budgeting	3.13%	18.62%	3.92%
Performance Management	7.81%	12.96%	19.61%
Divisionalisation	4.69%	3.64%	0.00%
Advanced Systems	6.25%	8.50%	31.37%
Strategic Management Accounting	0.00%	0.00%	23.53%
	100.00%	100.00%	100.00%

<i>ACCA</i>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>
MA and the Organisation	5.67%	9.91%	6.59%
Long Term Decisions	10.12%	16.04%	3.30%
Techniques	18.62%	12.26%	6.59%
Costing	44.53%	13.21%	6.59%
Planning and Budgeting	14.98%	29.72%	13.19%
Performance Management	5.67%	9.91%	28.57%
Divisionalisation	0.00%	2.36%	6.59%
Advanced Systems	0.40%	6.60%	28.57%
Strategic Management Accounting	0.00%	0.00%	0.00%
	100.00%	100.00%	100.00%

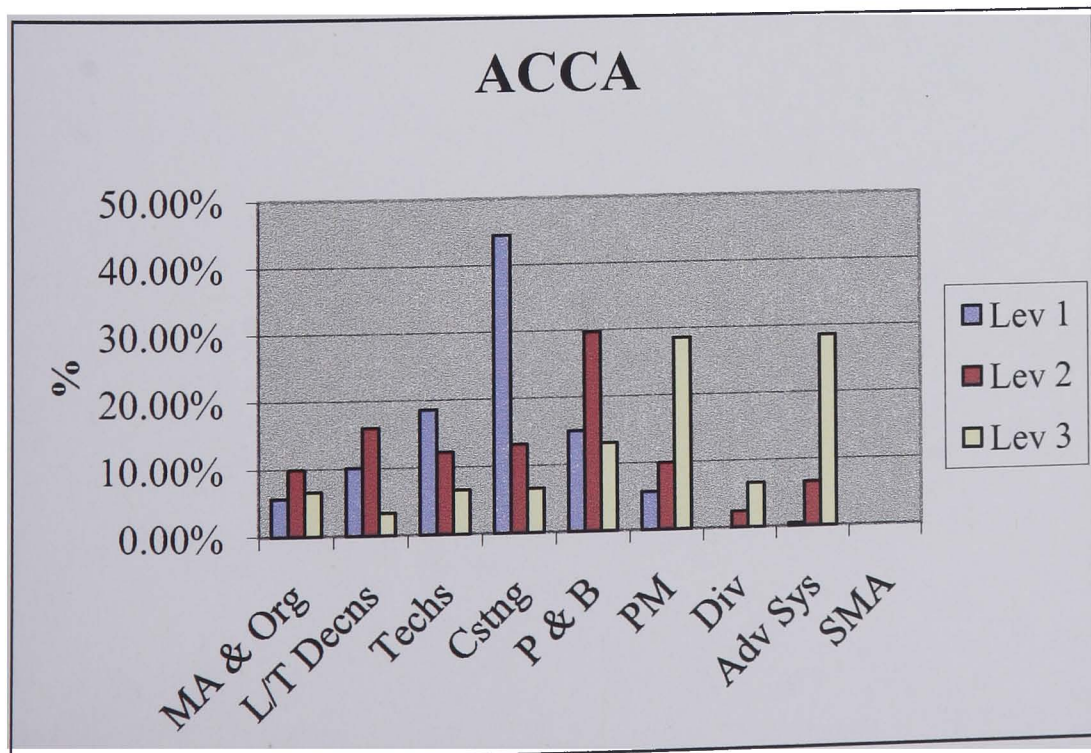
<i>ICAEW</i>			
MA and the Organisation	1.18%	0.00%	7.97%
Long Term Decisions	17.65%	0.00%	12.32%
Techniques	32.94%	3.57%	25.36%
Costing	9.41%	60.71%	18.12%
Planning and Budgeting	27.06%	19.64%	21.01%
Performance Management	5.88%	16.07%	13.77%
Divisionalisation	2.35%	0.00%	1.45%
Advanced Systems	3.53%	0.00%	0.00%
Strategic Management Accounting	0.00%	0.00%	0.00%
	100.00%	100.00%	100.00%



University



ICAEW

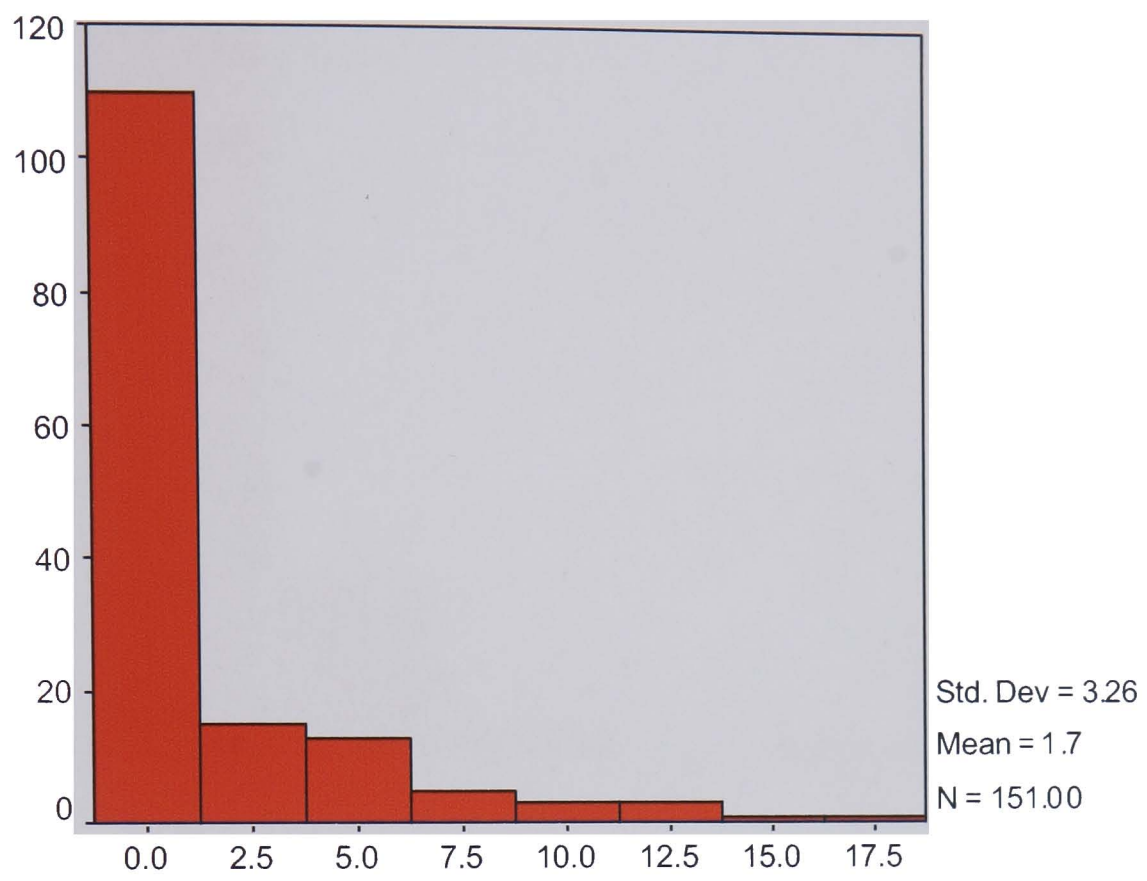


ACCA

## **APPENDIX 5**

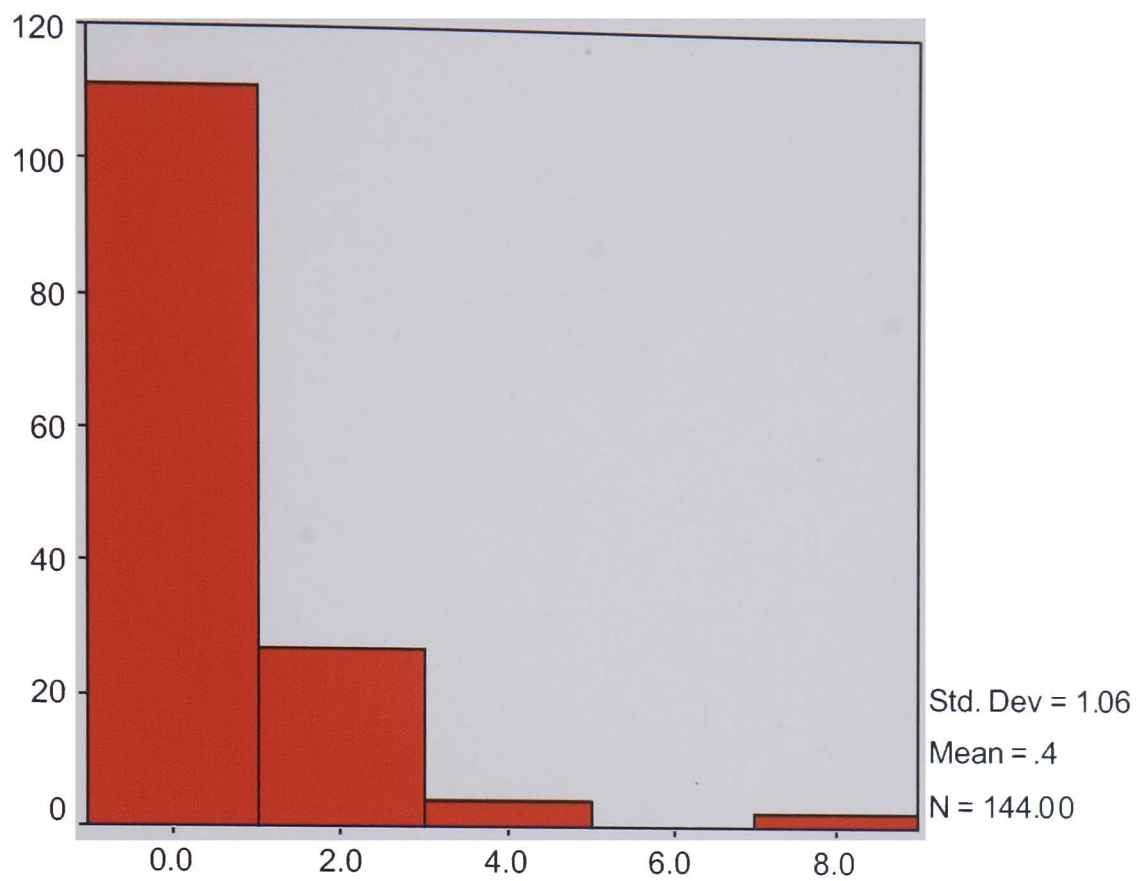
### **Skewness Graphs**

# LEVEL\_1



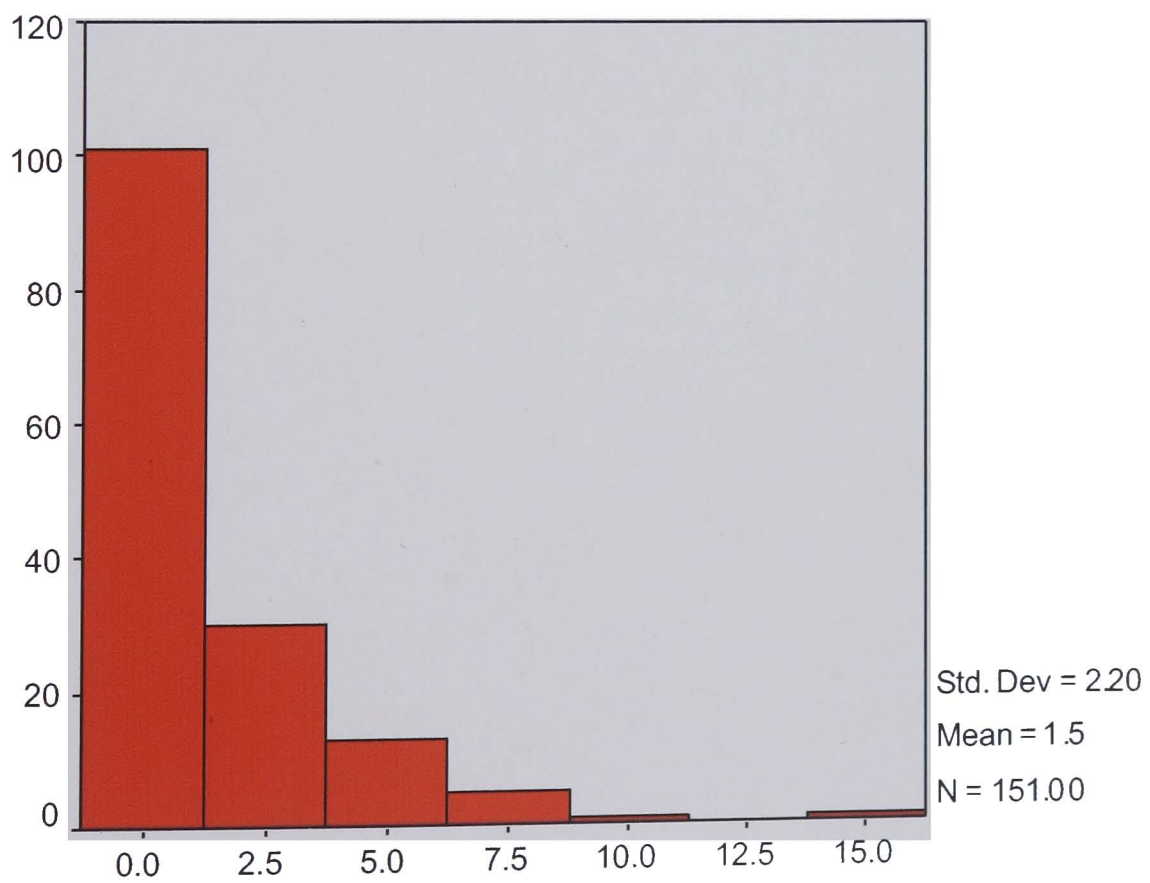
LEVEL\_1

YR1



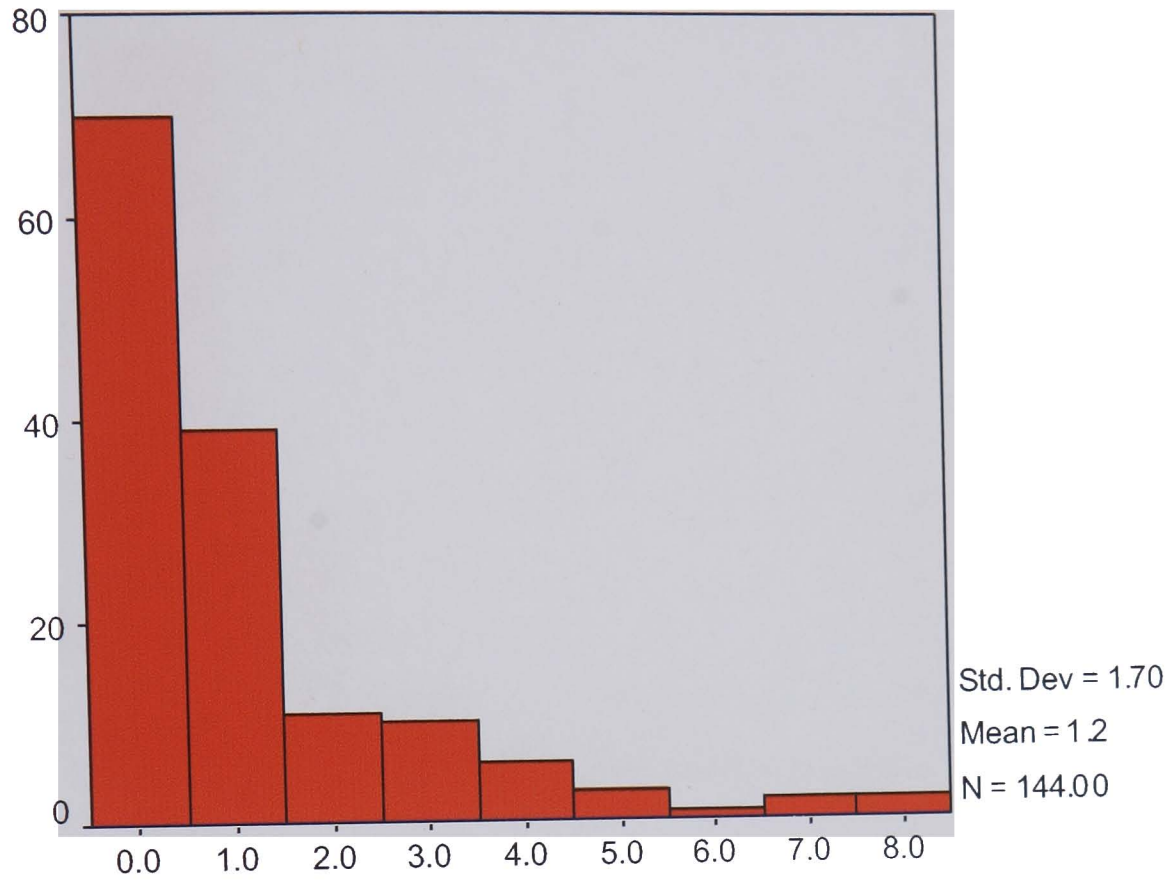
YR1

LEVEL\_2



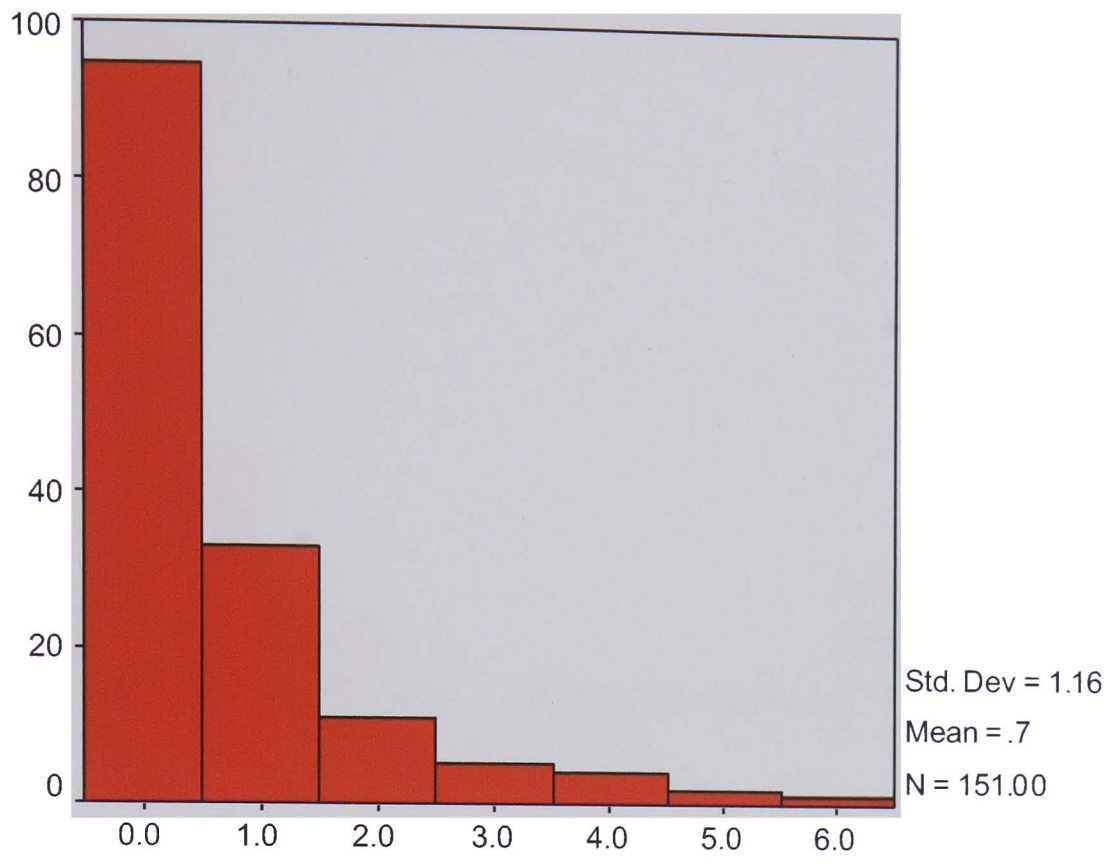
LEVEL\_2

YR\_2



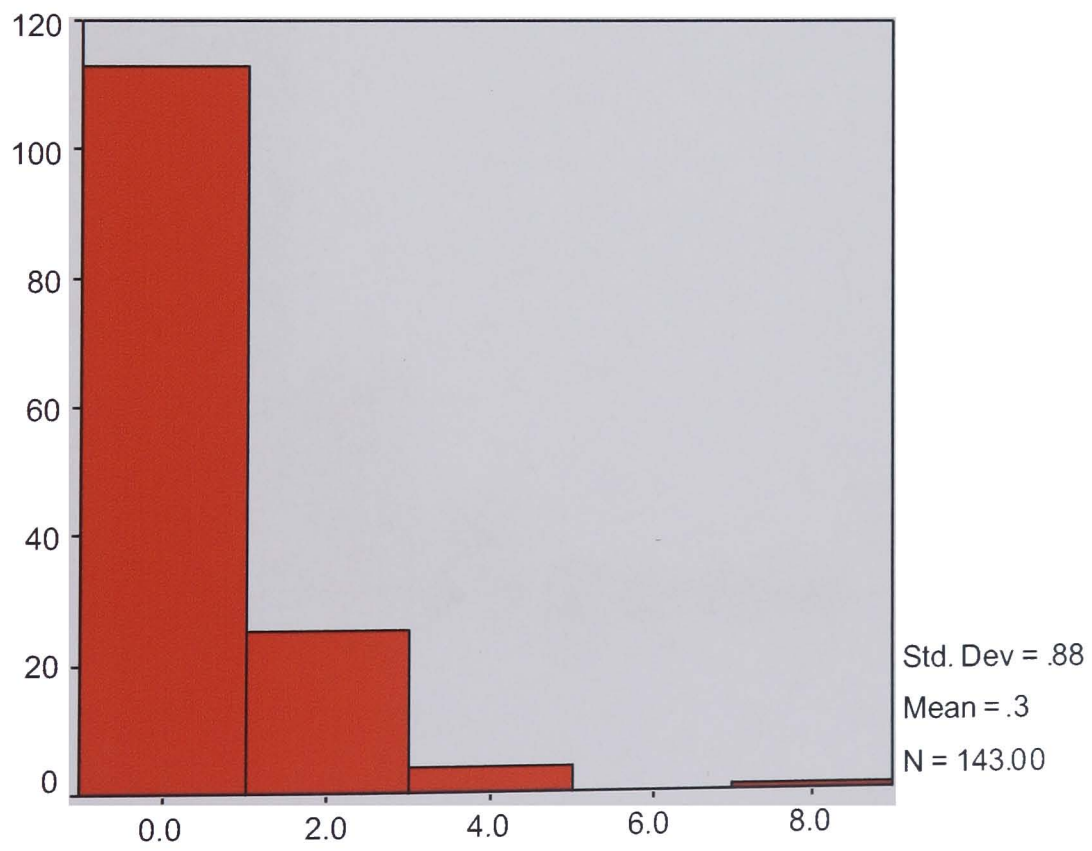
YR\_2

LEVEL\_3



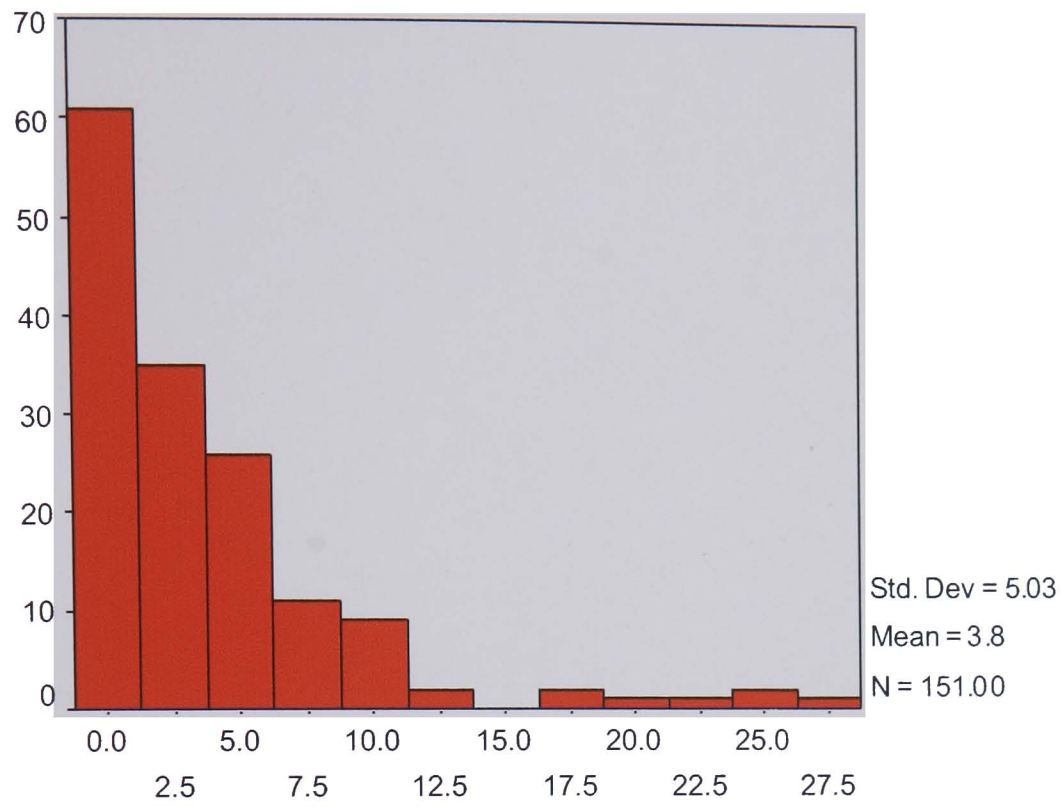
LEVEL\_3

YR\_3



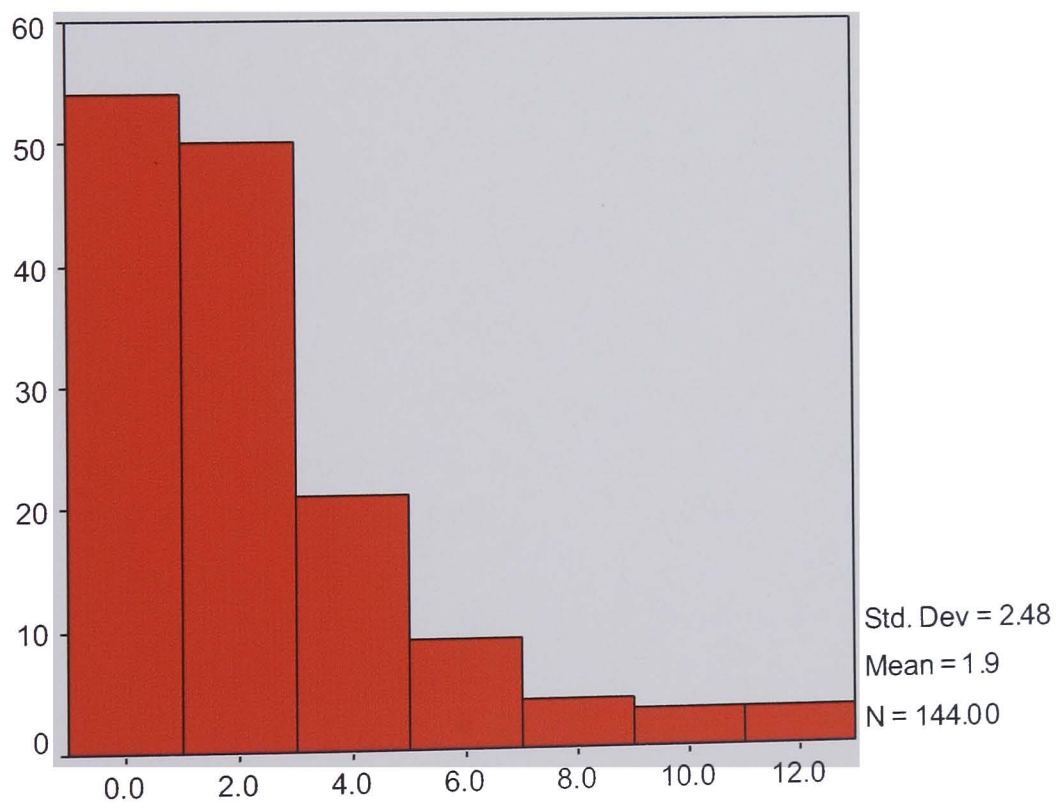
YR\_3

### Total ACCA



### Total ACCA

### Total University



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