THE STUDY AND LEARNING STRATEGIES OF STUDENTS IN A NEW ZEALAND TERTIARY INSTITUTION

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ABSTRACT

This research examined the study and learning strategies of students in the natural setting of a New Zealand teachers college. It was prompted by the researchers' professional interest as a teachers college lecturer, the need expressed in the research literature for in-depth longitudinal research into learning at the tertiary level, and the contradictory findings in that literature about students' attitudes towards learning and their ability to acquire a reflective, analytical and critical approach to study.

The researcher was interested in the strategies adopted by students when faced with their normal learning tasks in a teachers college setting. What determined the strategies that students used? How effective were these strategies? Did these strategies change with time and experience? Could these strategies be improved?

These questions were researched by means of a two-phase research design. Phase 1 was a longitudinal study of a single cohort (n=86) of Hamilton Teachers College students over the three year period of their preservice programme. The methodology here was a combination of quantitative and qualitative approaches. Psychometric instruments used were the Approaches to Studying Inventory - ASI (Entwistle and Ramsden, 1983), The State Trait Anxiety Inventory - STAI (Spielberger et al. 1968), The Expressed Vocational Commitment Scale - EVCS (Ramsay, 1978). Factor analysis of the ASI generated some alternative sub-scales which were also applied. Qualitative data to do with learning strategies and motivation stemmed from a series of five interviews over the three year period with two groups of students: 12 students selected for their high degree of a surface-confused approach to study and learning as revealed by their performance on the ASI, and 20 students who were randomly selected.

Phase 2 of the research involved a cross-sectional study of Year 1, 2, and 3 students (n = 136, 130, and 102 respectively), and a comparison of the perceptions of students and teachers college staff regarding students' development as learners. The cross-sectional application of the ASI was an attempt to offset special problems with factor analysis activity as a result of a smaller than desirable sample size in the Phase 1 longitudinal design. A sample of staff (n=13) was interviewed about their views on students as learners and also responded to a Staff Perceptions of Student Development Questionnaire (SPSDQ) which derived from factor analysis of the ASI. The items of the SPSDQ were embedded in the ASI as administered to the cross-sectional sample making it possible to directly compare student and staff perceptions of students as learners.

Students in the original (longitudinal) sample appeared not to develop as better learners, and their pattern of development strongly resembled that of students in an Australian study (Watkins and Hattie, 1983). Students in the cross-sectional sample did appear to develop in positive directions with an increase in deep learning and the development of positive attitudes towards learning. Whether the difference in the two populations was due to the relative maturity of the cross-sectional population or to a change in the college programme which was instituted between the two phases could not be determined. It is probable that both these factors were involved.

Interviews with students revealed insights into the motivational factors underlying student approaches to studying. In particular it was found that stress was an important factor related to students being surface-confused. Some surface-confused students also appeared to be basically deep learners who could not apply that mode of learning appropriately. The majority of students who were interviewed came to college with a surface approach to learning well in place. The advice with respect to studying that these students received at secondary

school reinforced that approach. Students appeared also to have ambiguous attitudes towards academic achievement. In general they did not wish to appear achievement orientated when responding to the ASI or to direct questions about achievement in the interviews. For some students it was apparent that this image they wanted to project did not match their learning behaviours. Staff and student perceptions of student development appeared to be in accord with respect to motivational and attitudinal factors but were opposed with respect to approaches to studying and general development. There was some support for the hypothesis that students with a versatile learning style at entry to college would have an academic advantage.

The findings have implications for teaching at the tertiary level, and have particular relevance therefore for staff development programmes in tertiary institutions. They also have relevance for the development of study skills programmes for students. Due to the increasing numbers of students staying at school longer, the study also has relevance for teaching at the secondary school level.

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CHAPTER ONE

INTRODUCTION

The history of research on the teaching-learning process indicates a heavy emphasis on the study of teachers and students in school classrooms rather than in tertiary institutions (Gage, 1963; Travers, 1973; Wittrock, 1986). Although interest and publications on andragogy (the art and science of teaching adults) are now burgeoning, speculative writings outweigh empirical studies. Indeed insofar as effective teaching is concerned, the field of andragogy is one of debate rather than consensus. One school of thought is that adult learners should not be taught in the same way as school children; that adults learn best when they are able to set their own learning goals, and when they are permitted to learn by discussion and problem-centred approaches rather than by didactic teaching (in particular, the lecture method). Others working in adult education, however, postulate that the same principles that underpin effective teaching in school classrooms are applicable also to adult learners; that all teaching methods appropriate to younger children are viable in the adult setting.

The continuing debate on the nature of 'good andragogy' has been paralleled in recent years by the increasing interest of tertiary institutions in improving the quality of teaching by academic staff. This interest is evidenced by the emergence of a number of organizations whose mission is the promotion of research and development of teaching at the tertiary level, including the sponsorship of in-service courses and the publication of guidelines on successful teaching practice (see, for example, Higher Education Research and Development Society of Australasia, and The Society for Research into Higher Education).

Despite these positive developments, in general teachers at the tertiary level do not have the benefit of teacher education

programmes either prior to or during their teaching appointments. And it is probably true to say that many, if not most, of these teachers conduct their lectures, seminars, tutorial discussions and demonstrations in much the same way that they were taught when tertiary students themselves. Again, apart from the obvious differences in academic ability among students, only in the last decade have tertiary level educators begun to consider seriously the impact on student learning acquisition of individual ways of processing information. Piaget's theory of cognitive development argues that most people have reached a formal operational mode of thinking by the age of 15 years (Inhelder and Piaget, 1958), a mode that is supposedly necessary for successful learning at the tertiary level. Yet some studies have indicated that formal operational thinking is far from being universal at that age, or indeed any other (for example, Niemark, 1975). Others point out that little is really known about the acquisition of formal operational thought because there are not enough longitudinal studies to provide us with valid generalizations (for example, Keating, 1980). Beyond these two criticisms, of course Piagetian theorizing and research have not focused on how adults actually go about the process of learning. For example, the following kinds of questions continue to attract attention from researchers and remain only partially answered.

1. What variety of preferred learning styles exists among adult learners?

2. Are there learning styles that are more effective for particular learners and for particular content areas?

3. What effects does tertiary education have on the ways that students at this level approach learning tasks?

4. Are there development stages in adult learning?

Purpose of the Study

The present study arose from the researcher's interest in the issues outlined above, especially as they might pertain to student teachers at the Hamilton Teachers College where the researcher is a member of the teaching staff. Several writers on the subject of adult learning have stressed the need for in-depth, longitudinal studies of tertiary level students' learning strategies and styles (e.g. Watkins and Hattie, 1983; Entwistle and Ramsden, 1983; Brabeck, 1983) and Hamilton Teachers College, with its long-term courses of study represented an appropriate research site. Primarily, however, the study was stimulated by the researcher's observation that a significant number of student teachers appeared to be using inappropriate learning strategies as they went about their various study assignments. In particular, many students tended to engage in reproductive-like activities and learning. Entwistle (1981), in the United Kingdom, had observed and researched similar learning patterns, which suggested that the problem might be quite general at the tertiary education level.

The present study, therefore, is an exploratory investigation of the learning styles and strategies of student teachers at Hamilton Teachers College. It involved all students who entered the three year Hamilton Teachers College programme in 1983. Most of these students had entered college directly from secondary school, and were representative of a wide range of secondary schools (mostly in the Waikato region).

The research aimed to describe what these students were like as learners at their point of entry to teachers college, and to observe any changes in learning styles and strategies that might occur over three years of their preservice programme. The study proceeded in two interrelated phases. A first and major phase was longitudinal in nature, and involved both quantitative and qualitative research methodology and data. Phase two emerged from the first phase and was a comparative study of student

cross-sections (first, second and third year students). Data collection in this second phase included staff perceptions of student learning and development.

It was hoped that the research would provide insights that would enable teachers college staff to better understand students as learners, and to adjust both teaching style and evaluation procedures in the interest of helping students learn more effectively. At the same time, it was anticipated that there might well be implications in the study's findings for inservice work among teacher educators and secondary school teachers who had interest in promoting the flexible use of study skills and strategies. In this regard, there was also the possibility in the future of producing study guides to assist new students in adapting to the requirements of study at the tertiary level.

Definitional Problem

Confusion sometimes occurs over just what constitutes an adult learner. Often it is taken to mean people who return to learning and study after a break from school, during which time they have been engaged in employment, bringing up a family, travel or some such activity. By this definition, a 17 year old returning to formal study after a period of employment would be considered an adult learner, while an 18 year old coming directly from school would not. For the purposes of the present study, an adult learner was defined as anyone who engages in further study after leaving secondary school, whether there has been a break or not.

The study was limited to students who were undertaking the Division A course at Hamilton Teachers College. This is a three year course which prepares students for primary teaching. During this time there were some courses which were taken by all students, but the programme of study is such that there are courses (particularly university courses) where students have choice as to the subjects they study.

Organization of the Study

The organization imposed on the review of the related literature not only provided a substantial framework for what is a very complex topic, but also provided categories for the main research questions, influenced the methodology and the reporting of the results.

The three categories which encompassed the concepts under investigation were as follows:

1. The Intention of the Learner. (This section deals mainly with what has been variously called Approaches to Studying; Approaches to Learning; Learning Strategies; Study Strategies and combinations of all of these).

2. The Learner's Motivation.

3. Learning Styles.

The research questions were principally concerned with investigating developmental trends and the relationship between strategies, motives, styles and student performance.

The context was the natural setting of Hamilton Teachers College, and included students in a longitudinal study as well as students in a cross-sectional study.

The methodology involved both qualitative and quantitative research procedures.

The report of the research is contained in two volumes as follows:

Volume One contains the review of the related literature (Chapter 2); the methodology chapters (Chapters 3 and 4); the reporting of the results (Chapters 5 through 9); the summary and conclusions chapter (Chapter 10).

Volume Two contains the appendices and the references.

CHAPTER TWO

A REVIEW OF THE RELATED LITERATURE.

As highlighted in Chapter One, there is much speculation and a paucity of research on the complex subject of adult learning. The review of the research literature in this chapter focusses on important questions related to six major facets of learning with respect to adult subjects. The six facets are by no means definitive, but represent an attempt to impose some organization on the complex area of adult learning. The six facets are as follows:

1. Learner intention
2. Motivation and learning
3. Cognitive style and learning style
4. The developmental aspect of adult learning
5. The content and context of learning
6. Quantitative and qualitative approaches to the study of learning processes and outcomes

The Intention of the Learner

When faced with an academic learning task, some students may have as their principal intention simply committing the learning material to memory, without necessarily understanding it. Yet others may have the principal intention of understanding, analysing or evaluating the subject matter. As discussed below, a number of factors may influence the intentions that a student may have in a particular situation. For educators, however, there is concern when a memorizing intention that is adopted is inappropriate for the learning requirements, or when this kind of intention is used exclusively.

The recognition of two distinct approaches to learning is not new. Amongst early researchers on human learning, for example, Wertheimer (1945) distinguished rote memorization from productive thinking, and showed in a classroom example how memorization of a rule actually prevented children from solving a problem when elements in the problem situation were only slightly changed. Wertheimer made a plea for less emphasis on rule memorization in classroom teaching (the predominant method at that time, and one which in his view followed naturally from Associationist Theory), and for more attention to be given to productive thinking. Ausubel (1968) likewise distinguished rote-learning from meaningful learning and stressed that the rote-meaningful dimension was independent of the reception-discovery dimension. He noted that many people involved in education seemed to be assuming that discovery learning was, by definition, meaningful and that reception learning was necessarily void of understanding. In Ausubel's view, meaning comes when learners can integrate new material into their existing cognitive structures. He emphasised the importance of the learner having a meaningful learning set, which means that the learner must have the intention of extracting meaning if the process of meaningful learning is to be successful.

Bruner (1960, 1964) saw meaningful learning occurring as a result of the learner building coding systems through a concept attainment process. The hypothetical construct of a cognitive structure is also a heuristic in Bruner's learning theory. In Bruner's view, meaningful learning set is a product of the teaching method he advocates, which relies on intrinsically interesting material, and on teachers who are committed to having children discover concepts, principles, generalizations and rules for themselves.

During the last decade two different approaches to the study of adult learning have emerged which impinge directly on the question of learner intention. These approaches may be loosely identified with the university where each of the research programmes originated, and are referred to throughout this review

as the Gothenberg Group and the Lancaster Group. The methodology adopted by each group is not exclusive to that group, for various researchers in other parts of the world have used similar approaches. What sets the Gothenberg and Lancaster research apart is the scope of their respective studies.

The Gothenberg Studies.

Marton (1975, 1978), a prominent member of the Gothenberg group, adopted what he called a phenomenographic approach to the study of learning. Deceptively simple, the approach attempts to study learning in a natural context through the eyes of the learner. In a typical Marton study, students were instructed to study a relatively short article, as if they were studying for an important test. Students were then interviewed to see how much of the article they could remember and understand. They would also explain how they actually went about learning it. Marton discovered that student responses generally fell into one or the other of two categories: some students explained the strategies they used to memorize what they considered to be the important points in the article; others described how they attempted to understand what the author was really trying to convey. The first approach Marton called surface-level processing, and the second deep-level processing. A small number of students sometimes described elements of both approaches and could not easily be classified.

Under Marton's leadership the Gothenburg group has extended this experiential approach in a number of related directions. Thus Marton and Säljö (1976a, 1976b), and Svensson (1977), have demonstrated that quality of outcome is positively related to a deep-level intentional approach. In the same series of studies, Marton and Säljö found that the type of questions anticipated by students for a test predisposed them to adopt a particular strategy. In addition, these researchers demonstrated that students who were matched for strategy and question type performed significantly better than students who were mis-matched.

Fransson (1977) examined how interest level, as well as perceived stress or anxiety, affected a student's approach to learning. Rote learning (surface-level processing) was associated with low interest in the subject and high levels of perceived anxiety.

In some of the Gothenburg studies (e.g. Marton and Säljö, 1976b), students' verbal reports on how they approached a learning task correlated positively with the nature of the questions which were designed to differentiate between surface and deep learning approaches. Surface learners, for instance, tended to do well on questions which required verbatim recall of factual material, but did less well when faced with a question such as "Explain in your own words what the article is about."

Svensson (1977) drew attention to the distinction between the process and outcome of learning. In Marton and Säljö's studies the learning processes were inferred from categories of student response (the outcome). Student descriptions of how they went about learning (the process) tended to corroborate the meaning given to the categories by the researchers. Svensson, on the other hand, started with students' descriptions of <u>how</u> they learned, identifying the described processes as being either holist or atomist. The holist attempted to understand the overall meaning of a passage and to discover the author's intentions; in contrast, the atomist focussed on parts of the text in <u>sequence</u> (not in terms of their importance), and on memorizing details. Svensson's analysis concluded that a holist approach to studying was a prerequisite for a deep level of understanding, and that the adoption of an atomist approach effectively prevented such understanding.

<u>The Lancaster Studies.</u>

A somewhat different approach was adopted by a research team at Lancaster University, led by Entwistle (1968). There, a series of inventories was developed for the purpose of predicting

subsequent levels of academic performance. Initial inventories, developed with relatively large samples of students from over 50 universities, were designed to investigate motivational and study skill variables, and how these related to subsequent academic success. A later version included items which checked personality factors, and still later developments attempted to build into the scale items which took cognizance of contemporary research in learning styles (e.g. Pask, 1976b), and also the Deep and Surface Learning constructs proposed by Marton. The culmination of these studies was the development of the Approaches to Studying Inventory or ASI (Entwistle and Ramsden 1983). This is a 64 item Likert-type scale yielding 16 sub-scales relating to various motivational, learning style and study strategy variables.

Between 1976 and 1981 Ramsden and Entwistle developed another scale which probed department or faculty variables such as assessment procedures, quality of teaching, and clarity of department goals (Ramsden and Entwistle, 1981). During 1981 the Approaches to Studying and the Perceptions of Departments inventories were administered to over 2000 students throughout Great Britain. The results of the study were published by the joint authors in the book entitled Understanding Student Learning (Entwistle and Ramsden, 1983).

Another study skills inventory had been developed independently by John Biggs in Australia. This was the Study Behaviour Questionnaire or SBQ (Biggs 1976). Comparing the factor analysis of the ASI and SBQ, Ramsden and Entwistle found interesting similarities. The intention to reproduce, and the intention to construct meaning come through as main factors in both studies. Biggs's analysis produced a third factor which he called 'organizing'. This corresponded with the ASI factor, Strategic Approach, and describes student attempts to organize material (See TABLE 2.1). The ASI analysis produced a fourth factor which was concerned with motivation, particularly with respect to a negative approach to learning and to disorganized study habits.

TABLE 2.1 Comparison of factors from the Approaches to Studying Inventory (ASI), Entwistle and Ramsden (1983), and the Study Behaviour Questionnaire (SBQ), Biggs (1978).

	FACTOR 1	FACTOR 2	FACTOR 3
ASI	Meaning Orientation	Reproducing Orientation	Strategic Approach
SBQ	Internalizing	Reproducing	Organizing

Learner Intention and the Nature of the Task.

The intention to either commit information to memory without understanding, or the opposite intention to gain meaningful understanding, can be task-dependent for many students. Laurillard (1979), for example, found that of 31 students in her study, 19 used different strategies on different tasks. The strategy adopted depended not so much on the intrinsic nature of the task but on how the student perceived it, especially in terms of its purpose. If the student's reasons for doing a task were intrinsic, a deep-level strategy would be adopted; but if extrinsic motivation predominated, then the approach would be at a surface-level.

Similarly, Brumby (1982) found that while 67 percent of her first-year science student subjects adopted a high degree of 'integration' (her term to describe the meaningful end of the rote-meaningful dichotomy), only 44 percent persisted with the same approach on another task.

These studies prompted Entwistle and Ramsden (1983) to conclude that dichotomies such as deep-surface could not be applied to individual students, but could only be used to describe students in particular learning situations. They suggested further that students might still have relatively stable preferences for one

approach (strategy) to the other. An analysis of the responses of 57 students whom they interviewed about their approaches to study showed this to be the case.

Thus the interview data obtained by Entwistle and Ramsden led them to a slightly different description of the deep and surface level processes from that of Marton. Deep level processing, they suggested, was not simply a result of the intention to gain meaning; similarly, surface level processing was not purely a manifestation of the intention to rote learn. They proposed three sub-categories for each approach as follows:

Deep-level Processing

(i) The learner has a desire to integrate the task with him or herself.

(ii The learner attempts to integrate parts into a whole.

(iii) The learner has an explicit intention to make the task meaningful.

Surface-level Processing

(i) The learner has a tendency to treat the task as an isolated phenomenon.

(ii) The learner approaches the task as a memory exercise.

(iii) The learner has an unreflective and passive approach.

(Entwistle and Ramsden, 1983, pp.142-5)

One of the conclusions reached by Entwistle and Ramsden was that deep and surface approaches, although meaning fundamentally the same thing in different subject areas, may involve varying emphases subject to subject for the sub-categories listed above.

To summarize, then, the foregoing research suggests strongly that while the intention of the student to either memorize learning material or extract meaning from it may be a relatively consistent characteristic, for many students it will be related

to the nature of the task, and how the student perceives that task.

Learner Intention and Academic Success.

The Gothenberg studies have consistently shown a clear relationship between quality of outcome (by which is meant a high level of understanding or integration) and depth of processing. Marton and Säljö (1976a), for example, found that all of the nine students in their sample who were categorized as deep level processors (i.e. they approached the learning of academic articles with the intention of gaining understanding) did, in fact, demonstrate a high level of understanding after learning. On the other hand, only one out of 14 students categorized as surface learners reached a comparable level of understanding (See TABLE 2.2).

TABLE 2.2 Relationship between level of outcome and approach to learning (from Marton and Säljö, 1976a).

Level of understanding	Approach to Learning		
	Deep	Not clear	Surface
High	9	6	1
Low	0	1	13

The Swedish results are open to criticism in that they are derived from small samples of predominantly female social science students, and the methods of analysis are relatively subjective. Watkins (1982a; 1983b), however, attempted to overcome these weaknesses by using a larger sample of students drawn from three university departments. Moreover, as a means of determining the level of outcome more objectively, he also utilized the SOLO Taxonomy (Collis and Biggs, 1982). The categorization of students as deep or surface learners was based not only on the indicators suggested by Marton and Säljö (1976a) and Laurillard (1979).

(i.e. based on interview reports), but was confirmed by their scores on the ASI. Watkins' findings supported the general conclusion of the Gothenberg group that the intention to either understand or reproduce is significantly related to the quality of the outcome (See TABLE 2.3).

TABLE 2.3 Depth of processing and Solo ratings of quality of outcome (Watkins, 1983b).

	Depth of Processing	
Solo Rating	Deep	Surface
High	25	6
Low	2	23

(χ^2 = 28.9; p < .01)

A deep level of processing, however, is not a necessary requirement for academic success since academic achievement is not always measured in terms of a learner's understanding of what has been learnt. Some schools -- and even university departments -- lay considerable store on students being able to reproduce what has been taught. Particular subjects may require mastery of material in a verbatim sense before work at a higher level can proceed. Examples might be the learning of formulae, special vocabulary or procedures.

Some students, then, may be predisposed to adopt a surface learning approach as a result of several factors such as previous learning experiences, goals set by teachers, methods of evaluation, style of teaching, high work load, the nature of the task, and motivational variables such as high levels of anxiety. The achievement of some success only serves to reinforce the approach to learning adopted. That surface learners can succeed even at higher levels of university education can be seen in TABLE 2.4. Entwistle and Ramsden (1983) related students approaches to learning with the quality of university degree obtained (First Class and Upper Seconds, or an Ordinary Degree

Pass). Of the 21 students classified as surface-learners, five, in fact, did finish with a good degree.

TABLE 2.4 Level of approach and degree result. (Entwistle and Ramsden, 1983, p.177).

Quality of Degree	Approach to Learning		
	Deep	Surface	Total
Good Degree	16	5	21
Other Degree	10	11	21
Total	26	16	42

(X^2 = 2.52; p (one-tailed) < .06)

In summary, it may be concluded that students who approach learning tasks with the intention of understanding are more likely to achieve success -- whether success be in terms of academic grades or in quality of learning outcome which, as has been pointed out, are not necessarily the same thing. Deep learners have been found to be more versatile in their approach to learning (Svensson, 1977), a factor which enhances their ability to succeed in situations where the ability to reproduce the learning material is emphasised. The philosophical question remains , however, as to whether verbatim recall can ever be considered a legitimate goal of education. If one considers the latter as so, then surface learners too, could achieve academic success.

Summary and Comment.

The intention of the learner to rote-learn or obtain meaning, has been recognized for many years. Several educators have pointed to the inadequacy of simple rote learning and have suggested teaching methods which, in their view, would enhance meaningful learning (e.g. Bruner, 1960; Ausubel, 1968; Wittrock, 1974)

Recent research in Sweden, the United Kingdom, and Australia has shown that a deep approach to learning is far more likely to result in higher quality of learning outcome. Nevertheless, it is apparent that at all levels in the education system, and particularly at the tertiary level, conditions exist which predispose students to adopt a surface approach to learning. Some of these conditions, which research indicates are strongly associated with a surface approach to learning, are as follows:

- Heavy student work load.
- Methods of evaluation which stress accurate recall and frequent testing.
- Poor teaching.
- Motivational variables such as high anxiety and extrinsic motivation.

Laurillard (1979), and Brumby (1982), found that deep and surface approaches tend not to be fixed characteristics of students. The majority of students in their studies varied their approach, the approach adopted depending upon the nature of the task and the student's perception of that task. The suggestion that learning styles are also task dependent for many people is discussed in more detail in the section on learning styles. The principal issue, however, is that a reproducing approach seems to be predominant, and is often used inappropriately. Indeed, for many students a surface approach becomes habitual. The finding that a reproducing approach leads to a lower quality of learning outcome, means that this is a cause for concern.

While the terms 'surface approach' and 'deep approach' seem relatively easy to understand, in fact there are problems associated with their interpretation which derive from the different ways in which they have been operationally defined. The Gothenberg work, for example, suggests that a student is either a deep learner, a surface learner, or is indeterminate in his or her approach to a learning task. The analysis would appear to be uni-dimensional, with the deep and surface approaches being at opposite poles and the indeterminate category being in the centre.

The Lancaster work, however, suggests a multi-dimensional model. It is possible for a student to score considerably above the mean on both the surface approach and deep approach sub-scales. The difference arises because the Lancaster scale refers to how a student generally goes about learning, and so it is not inconsistent for a student to appear to be both a deep and surface learner. The scale indicates that sometimes she or he may adopt one approach, and sometimes the other. It is contradictory, however, to suggest that a student can adopt both approaches with a single task - unless the task is a complex one which can be divided into sub-tasks.

Research Needs.

1. With respect to the stability of student approaches to learning.

   The finding that a student's approach to learning might vary from task to task, and from time to time, is well established. The research which gives rise to this assumption, however, has been concerned with student approaches to tasks within a fairly limited time span, and within the limits of a single subject domain. In some instances (e.g. Brumby, 1982) the variability may even have been elicited by the nature of the tasks selected for the research purposes. It is not clear whether over a longer period of time, and in the wider context of a general university degree course, that such variability would still be apparent, or whether one intention or the other would tend to dominate and become habitual. It could be, for example, that as time goes on a student could become 'caught up', or more intrinsically concerned, with the courses being studied and thus adopt a deep-level approach more consistently. On the other hand, increasing pressure, high work-load, and anxiety, might lead a student to becoming more proficient at succeeding with surface-level intentions. Obviously both scenarios are possible. It would be

important, however, to find out whether one approach or the other would be likely to become more typical.

2. Concerning the relationship between approaches to learning and academic achievement.

The research discussed in this section suggests that a deep approach to learning is related to higher quality of learning, and is not necessarily related to academic achievement (especially achievement in the narrow sense of grade points for specific assignments). It is less clear what the relationship between approaches to learning and academic achievement might be over a full three-year course. To take but one example, in a teachers college which qualifies its students' graduating diplomas With Distinction, With Commendation or Pass, what might be the relationship between these qualifications and the approach to learning adopted by students?

Motivation and Learning

While learner intention and motivation are closely related, motivation means more than just intention. Motivation is a diffuse construct which has been variously defined and explained over the years (e.g. Berlyne, 1961; Atkinson, 1964; Weiner,1972, 1980). Most theorists, however, recognize two principal features of motivation: "...it describes what energizes a person and it directs his behaviour" (Gage & Berliner, 1979). Some add two further features: "motivation can allow a behaviour to persist, and it can lead to a person choosing or preferring a particular behaviour" (Wlodkowski, 1985).

In the context of higher learning, the goal aspect of motivation is usually fairly prominent and readily identified.

There may be short-term goals such as assignments and tests, and long-term goals pertaining to graduation and/or a career. Goal-strength, however, is a quality rarely touched on in educational research, mainly because of the difficulty in its quantification. Ramsay (1978) attempted such a measure by constructing a vocational commitment scale. This scale produced a measure of how strongly a student teacher or nurse was committed to the vocation the person had entered. Ramsay discovered that not only was there a wide range in commitment scores between students but that, over time, there was considerable variation in individual scores.

The energy aspect of motivation on the other hand has been the subject of considerable theoretical discussion and research, and several theories of motivation have evolved, e.g. Needs Theory, Arousal Theory, and Attribution Theory. Several variables have been isolated which seem to affect learning, some of which are of particular relevence for tertiary learning (e.g. intrinsic-extrinsic motivation, achievement motivation, and locus of control).

Uguroglu and Walberg (1979) reviewed studies relating motivation to academic learning. Their analysis of 232 correlations reported in 40 studies with a combined sample size of 637,000 children from Grades 1 - 12, revealed that 98 percent of the correlations showed a positive relationship. In discussing the proposition that a motivated person will always surpass an unmotivated person in performance and outcome, Walberg and Uguroglu (1980) say:

> "...we know this as we know a rock is hard and water is wet. We do not need reams of research findings to establish this reality for us .... to put it quite simply, when there is no motivation to learn there is no learning." (p.6)

There are two reasons why an analysis of motivational variables is important. The first is that people are motivated differently -- what motivates one person may have little effect on another. Secondly, some forms of motivation are seen as being

more desirable than others; intrinsic motivation, for example,is invariably preferred by teachers in respect of their pupils than extrinsic motivation. University lecturers, when asked to describe the attributes of a good student were unanimous in indicating that they expected students to be interested in the subject for its own sake (Entwistle and Percy, 1971). Similarly, internal attribution of causes is seen to be preferable to external attributions (Rotter, 1966; De Charms, 1968; Weiner, 1974).

The motivation of successful tertiary-level students.

Entwistle and Wilson (1977) used cluster analysis techniques to see whether successful students followed similar or different paths to success. They identified three successful groups. One outstandingly successful group was motivated principally by ambition or hope for success. A second successful group was characterized by lack of confidence, high scores on neuroticism and introversion, and was motivated principally by a fear of failure. The third successful group consisted mainly of Arts and Humanities students who had high aesthetic and low economic values, was syllabus-free, spent long hours in study, had good study methods and was intrinsically motivated. In contrast to these three kinds of successful groups, the least successful students were those who spent little time in study, had poor study methods and preferred non-academic pursuits such as sport.

Biggs (1978, 1979) noted different motivational components as follows for each of the three dimensions of study processes identified by factor analysis of his Study Behaviour Questionnaire:

STUDY PROCESS	MOTIVATION COMPONENT
1.Utilizing	(a) Pragmatic reasons for attending university. (b) Avoidance of failure
2.Internalizing	Attending university is seen as a way to self-actualization. There is interest in the subject for its own sake.

3.Achieving	The motive is to obtain high grades for their own sake as part of a general competitive attitude to life.

It is interesting to note that these quite independent studies come to virtually the same answer to the question: "What motivates successful university students?" Such students appear to be either striving to achieve, afraid of failing, or are intrinsically motivated. The student with mainly pragmatic reasons for obtaining university qualifications (noted by Biggs) might illustrate a fourth type of motivation which could be more apparent in vocationally oriented institutions such as teachers colleges, schools of nursing, and technical institutes.

Four of the motivational variables highlighted in these studies above are considered in some detail below. These are: achievement motivation, fear of failure, intrinsic-extrinsic motivation and locus of control.

Achievement motivation.

Achievement motivation is a term which lacks consistent definition, not only from study to study but even within a single research domain. The term is sometimes used in a fairly general sense and indicates an individual's need to do well or succeed at something. It subsumes constructs such as hope for success, fear of failure or anxiety (Murray, 1938; McClelland et al., 1949; Atkinson and Feather, 1966).

In their respective questionnaires on the study process both Entwistle and Biggs use the term in a narrower sense that is distinguishable from, rather than inclusive of, fear of failure. They give a picture of an achievement motivated individual as a 'go-getter' who is out for high grades from a sense of competition and a need to be superior. This kind of student is

reminiscent of Heath's 'Hustler' (Heath, 1964). The ASI, however, also has a grouping of sub-scales suggested by factor-analysis which is broader in meaning which Entwistle and Ramsden (1982) call an Achievement Orientation. The subscales which combine to give this orientation are Achievement Motivation (in the narrow sense), Intrinsic Motivation, and Surface Approach. The orientation is associated also with elements of both deep and surface learning which is consistent with a previous finding (Entwistle, Hanley and Hounsel, 1979) that students with an achieving orientation will seek high grades using meaningful or rote learning, whichever seems to produce results.

The relationship between achievement motivation and academic performance is not clear. Entwistle and Ramsden (1983) correlated inventory subscales with students' self-reports of academic progress. The results showed that academic performance was most closely related to organized study methods and positive attitudes to studying, rather than to achievement motivation per se.

Watkins (1982a) correlated inventory scores with academic results for first year students at the Australian National University. Again, organized study methods and positive attitudes to study were highly significant. Achievement motivation, however, correlated positively with academic results ($p < .01$) for science students only. The correlations were not significant for Arts and Economic students; nor for the combined student population. Why were science students at the Australian National University different? Is it the different kinds of demands that science courses put on their students, or are students who opt for science courses motivated differently? Watkins and Hattie (1983) found that students who withdrew from university had lower scores on achievement motivation than had students who persisted.

Fear of Failure.

Failure affects performance differently for different people,

the determining factor seeming to be whether the motivation to avoid failure is greater than, or less than, the motivation to succeed (Weiner 1972). When the motivation to avoid failure is greater than the motivation to succeed, the experience of failure tends to reduce the level of motivation: the individual becomes discouraged, confidence is lost and there is a tendency to give up easily. The experience of success, on the other hand, increases the level of motivation for these students: when failure is experienced by individuals whose motivation to succeed is higher than their motivation to avoid failure, motivational level is increased and they will work harder to overcome the failure. Success, on the other hand, may leave such people feeling flat and their level of arousal is decreased.

Fear of failing can be a particularly intense form of motivation. It may result from parental pressure and expectations, or the individual's perception that failure will have some disastrous consequence such as loss of career opportunities, or further studies becoming impossible through loss of a bursary. Consequences such as these may give rise to high anxiety, and there are many studies which relate high levels of anxiety to impaired performance in learning (e.g. Saronson et al., 1960; Cronbach and Snow, 1977). Entwistle and Ramsden (1983) found that the Fear of Failure sub-scale of the ASI was strongly associated with the Surface Approach, Syllabus-bound and Improvident Pathology sub-scales. These sub-scales together form what they call a Reproducing orientation.

Intrinsic and Extrinsic Motivation.

Intrinsic and extrinsic motivation appear to be associated with different approaches to studying, intrinsic motivation being linked to a deep approach and extrinsic motivation to a surface approach (Entwistle and Ramsden, 1983). Contrary to what might be expected, they are not consistently related to academic success, at least at the undergraduate level. For example, the successful students described by Biggs, and by Entwistle and

Wilson, could be motivated by achieving high grades (extrinsic motivation), or by interest in the subject (intrinsic motivation). Studies which have correlated the ASI subscales with academic achievement, however (Watkins, 1982a; Entwistle and Ramsden, 1983), found that intrinsic motivation correlated positively and extrinsic motivation negatively with academic grades.

In their statements at least, teachers tend to place higher value on intrinsic than extrinsic motivation - there is an expectancy that good students are motivated by interest in the subject and in learning for its own sake. It may well be unrealistic, however, to expect all students to be intrinsically motivated regarding all study areas. In a teachers college, for example, where a good proportion of the subjects studied are compulsory for all students, it is not unusual for some students to feel resentful about certain subjects which they perceive to be non-relevant or too theoretical.

Locus of Control.

Whether people attribute their successes and failures to their own abilities and efforts, or attribute them to external causes such as luck or environmental influences, is a motivational variable which may well affect their general attitude towards and approach to study. Rotter et al. (1966) developed the I-E Scale to provide a measure of internal-external attributions of causality. The relationship between I-E scores and Need-achievement has been found to be generally weak (Weiner 1972), even though it seems reasonable to suppose that individuals who perceive outcomes to be under their personal control would engage in more achievement related activities than would individuals who believe outcomes to be externally controlled. Numerous studies utilizing the I-E scale and similar self-reports (e.g. the Intellectual Achievement Responsibility Scale developed by Crandall et al. 1965), led Weiner (1972) to conclude that locus of control is not a unidimensional construct.

Individuals who attribute their successes to internal factors may or may not attribute their failures to themselves (p. 243). High externality scores, however, do seem to correlate strongly with anxiety (Watson, 1967). Given this relationship, it would seem logical to expect external attributions to be linked with a surface approach to learning.

Watkins (1983c) tested the hypothesis that internal attribution of responsibility is a necessary, but not sufficient, condition for deep level processing; put another way, that it is necessary for learners to accept responsibility for their own learning before deep level processing is possible. No significant relationship was found between internal locus of control and any of the indicators of deep level processing on the ASI.

A related personality dimension in Attribution Theory is Learned Helplessness (Seligman, 1975). Learned helplessness is apparent when individuals attribute their failures to lack of ability, and their successes to external factors. Ability is perceived by these people as a relatively stable factor resistant to change, external factors are perceived as being outside their control, and they thus feel powerless. Miller and Norman (1979) distinguished three features of learned helplessness:

1. Reduced motivation to control events.

2. Impaired ability to learn how to control a situation.

3. Strong fear which rapidly leads to deep depression.

This pattern of helplessness can apparently be broken by changing the attributions, so that success is attributed to ability and failures to lack of effort (Dweck, 1975; Heckhausen, 1975).

It is not clear to what extent learned helplessness is a factor in the motivation of students at centres of higher learning. There is insufficient research in the area to reveal any consistent patterns.

Motivation in the Gothenberg studies.

The Gothenburg studies generally did not attempt to identify or quantify motivational variables. From the transcripts, however, it is fairly clear that students identified as engaging in deep-level processing expressed interest in the subject, wanted to understand and spent long hours studying. In other words they were intrinsically motivated. Students who adopted a surface approach were generally not interested and also expressed more anxiety. Fransson (1977) looked specifically at the effects of anxiety and interest on student approaches to learning. He concluded that if deep level processing is valued, then every effort should be made to avoid threatening, anxiety provoking situations which rely mainly on extrinsic motivation.

Summary and Comment.

We have a fairly clear picture of variables that motivate successful students at the tertiary level: they may have strong interest in a subject; a love of learning (intrinsic); they may be afraid of failing; they may be driven by a strong need for success; or they may have pragmatic reasons pertinent to the attainment of qualifications. Students who fail tend to have disorganized study skills and/or have negative attitudes to studying, and may possibly have strong competing motives related to social activities or sport. These findings would suggest that an integral part of any counselling system within a tertiary learning institution should be a means of early identification of students with disorganized study skills and negative attitudes, and a support system to give relevant assistance.

With regard to specific motivational variables, extrinsic and intrinsic motivation are related to deep and surface approaches to study and hence quality of learning outcome rather than academic success per se. This type of motivation is also related to the type of course, the quality and method of teaching, and methods of course evaluation.

Attribution of causality does not seem to relate significantly to the success or failure of students, although research in this area is very meagre at present.

There is no denying that motivation is a vital component in learning, but because of the shifting emphases and valences of motivational variables within an individual, motivation is difficult to pin down and quantify. Perhaps the best approach to take in a longitudinal study of learning would be to utilize frequent interviews with the subjects, combining qualitative and quantitative data.

Research Needs.

Given that tertiary-level students must meet minimum entry requirements, differences in student performance are more likely to reflect differences in motivation to a greater extent than differences in ability. Motivation, however, is an extremely difficult construct to quantify. Apart from the looseness of definition of some of the variables involved (e.g. achievement motivation), some aspects of motivation are also far from stable, and may vary from one day to the next. In the case of a teachers college it would be interesting to consider to what extent variables such as commitment to teaching, achievement motivation, extrinsic and intrinsic motivation, fear of failure and anxiety are stable characteristics of students, and which are most strongly related to student successes and failures. A negative attitude towards learning, combined with disorganized study methods, has been found to be significantly correlated with student failure (Watkins and Hattie, 1983). The question arises,

therefore, as to whether early indications of these characteristics would be a useful means of identifying students who are at risk.

Cognitive Style and Learning Style

The strategy a person will adopt in a learning situation depends not only on the intention of the learner, but on fundamental differences in how people actually see or perceive a task or situation. Presumably, such differences will predispose a person to adopt a particular learning strategy more readily and consistently than others. The term generally used to describe some consistent or preferred approach to similar or different tasks is style. Strategy, on the other hand, refers to the way one goes about a particular learning task. One person's strategy, therefore may or may not be consonant with his or her style in any particular situation (Pask, 1976b; Brumby, 1982; Entwistle and Ramsden, 1983).

A further distinction needs to be made: that between the term 'cognitive style' and the term 'learning style'. The research literature tends to use these terms rather loosely. For example, Peterson (1982), writing in the Encyclopaedia of Educational Research, says, "Cognitive styles are what many educators are discussing when they use the term learning styles." (p.845), indicating that the terms are often treated as being synonymous. The term learning style, used as a descriptor for a computer-aided search of the research literature, produced an extremely broad range of topics, including articles on cognitive style. It should be noted that the present study accepted Messick's (1976) definition of cognitive style as "Habitual ways of processing information" (Messick, 1976, p.6), and distinguished Learning Style as referring to what a person actually does in a preferred and consistent way in learning situations. As defined here,

therefore, learning style is more behaviourally orientated, and may be as much the product of training, habit, and motivation as it is of perception and cognitive style.

Cognitive Style

Early studies on cognitive style tended to use children as subjects. One result of this has been a confounding of the themes cognitive style and cognitive development. For example, the descriptive, analytic and relational styles found among children by Wallach and Kogan (1965) have both style and developmental dimensions, children being able to see relations and think analytically as a function of age. Another example is the cognitive complexity and cognitive simplicity styles reported by Bieri et al. (1966).

Two of the best known cognitive style analyses derive from perceptual tasks. Thus Kagan et al. (1964), developed a perceptual task which required subjects to select the drawing from eight highly look-alike drawings, that exactly matched a given standard (the Matching Familiar Figures Test). Subjects were put under two kinds of pressure: they had to respond as quickly as possible (the time factor), and they had to be accurate (the accuracy factor). Two distinct styles emerged: impulsive students sacrificed accuracy in the interests of being fast; and reflective students, while being more accurate, tended to be very cautious, ignoring the need to be quick. Again, a developmental trend was apparent, as intellectually advanced children tended to be fast and accurate.

Witkin et al. (1977) required subjects to identify a geometrical figure within a complex figure (the Embedded Figures Test), a task that is similar to popular puzzles in children's comics whereby one has to find a certain number of objects or animals hidden in a picture. Some subjects found the embedded figures almost immediately, finding the task rather easy. These Witkin labelled field-independent. Other subjects, however, had

great difficulty in seeing the hidden figure, even when it was pointed out to them. These subjects were said to be field-dependent.

Frostig's Test of Visual Perception (Frostig, 1964) uses a very similar task, but what Witkin calls field-dependence, Frostig attributed to faulty development of figure-ground perception. Witkin, however, argues that the field dependent and field independent styles are not simply a matter of under or well developed perceptual skill, but are due to fundamentally different ways of perceiving.

Just as Frostig generalized the figure-ground dimension to areas such as auditory perception, Witkin, too, tends to generalize well beyond the focus of his research tasks as set. Thus he argues for the existence of underlying styles of thinking and learning which stem from individual differences in processing visual information. The field-independent student adopts what Witkin calls an articulated style, characterized by a particular way of structuring and analysing incoming information. The field-dependent student, on the other hand, adopts a global style whereby the learner is chiefly concerned with the totality of his impressions.

The relationship between the cognitive styles of field-independence and field-dependence, and of these to the many variables in the teaching-learning situation, have been the subject of extensive enquiry. Much of the research has been reviewed and summarized by Witkin and his associates (Witkin et al., 1977). Some interesting findings relate to the effects on learning of matching and mis-matching the cognitive styles of students and their teachers. Students seemingly prefer teachers who have cognitive styles similar to their own, although Witkin argues that learning ought to be more effective if they are mis-matched. He reasons that field-dependent students need pre-structured information, since they are less able to impose their own analytic framework. They are more likely to experience this from field-independent teachers who are characterized by a

tendency to impose more logical structure on teaching material than do field-dependent teachers.

Another finding reported by Witkin and his associates, which is of particular relevance to tertiary learning, is that field-dependent students tend to select courses in the humanities, social sciences and education, while field-independent students tend to select courses in physical science, mathematics and engineering.

Other analyses of cognitive styles have been proposed. Kogan (1971), for example, reviewed 23 dichotomies of cognitive style. He noted that not all of these were easily distinguishable from one another, and that some appeared to be different in name only.

The 1981 annual conference of the American National Association of Secondary School Principals (NASSP) had, as its theme, discussion and exchange of information on student learning styles and brain behaviour. Shortly after this conference, the NASSP moved to form a task force under the leadership of James W. Keefe, the Association's director of research. This task force comprised researchers and practitioners of widely diverse backgrounds, but with a common interest in the cognitive style field. They adopted a definition for cognitive style that is very similar to that used in the present study, and used the umbrella term learning style to include cognitive style, affective style, and physiological style. Some 31 cognitive, affective, and physiological variables are now under investigation (Keefe, 1985), and the task force aims to produce a test-battery which will provide practitioners with complete learning style profiles of their students. With this information, according to Keefe, teachers will be able to either match the environment to the existing skills of the learner, or help the learner adapt to the new demands of the environment (cf. Piaget's assimilation / accommodation processes).

The results from such a major study will be of considerable interest to educationalists in terms of their utility. Some

researchers in the field, however, have doubts as to how useful such an instrument might be. Biggs and Telfer (1981), for example, suggest that little will be gained from categorizing students in terms of cognitive style. They maintain that a more fruitful approach would be to aim for a better understanding of the learning process, notwithstanding that some aspects of cognitive style will probably have some bearing on this process. Another implication of such matching, however, would probably mean the individualization of instruction at a level which would be beyond the resources of most contemporary education systems.

FIGURE 2.1 lists the variables that are being studied by the NASSP task force. It will be seen that the cognitive styles discussed earlier are all included.

COGNITIVE VARIABLES

* perceptual strengths
  - -auditory/verbal
  - -visual/spatial
  - -tactile
  - -kinaesthetic
* field-independence/ dependence
* simultaneous/successive
* need for structure
* sharpening/levelling
* focussing/scanning
* narrow/broad
* reflective/impulsive
* complex/simple
* selective attention

AFFECTIVE VARIABLES

* perceptual preferences
  - -auditory/verbal
  - -visual/spatial
  - -tactile
  - -kinaesthetic
* achievement motivation
* risk-taking/cautiousness
* social motivation
* anxiety
* persistence
* active/reflective
* thinking/feeling
* need for structure

PHYSIOLOGICAL VARIABLES

* time of day preferences
* need for mobility
* environmental elements
  - -sound
  - -light
  - -temperature
  - -design

FIGURE 2.1 Research variables under study by the NASSP Learning Style Task Force (Keefe, 1985).

Learning Style

Origins in modern learning theory. Learning style was defined earlier as "what a person actually does in a preferred and consistent way in learning situations." In terms of this definition, issues in learning style go back at least to the beginning of this century. Associationist psychologists, exemplified by Thorndike (1932), argued that learning is a trial and error process and occurs by means of step by step sequences. In contrast, Gestalt psychologists (e.g. Kohler, 1925) held to the view that learning occurred as a flash of insight which, in order to occur, had to be preceded by a perception of the whole learning situation.

The associationist tradition has continued through the work of B.F.Skinner and his followers who see learning as the cumulative linking together of parts in a sequence of small steps. In these earlier studies, based on animal learning to a considerable extent but also carried into the field of human verbal learning (McGeoch and Irion, 1952), the emphasis was on proving or assuming one approach to be superior to the other. In learning a poem for example, is it better to adopt a word by word, line by line approach, or should one try to learn it as a whole? In recent times it has been recognized that it is not simply a question of one method being superior for all people over all learning situations. People have preferred ways of learning which may have their basis in inherently differing ways of processing information, but depending also on experience, type of material, and many other factors (including motivational, personality and situational influences).

Contemporary research. The opposing positions of Associationist and Gestalt psychology seem to persist as fundamentally different ways of going about learning. Some learners concentrate on breaking a learning task into its component parts, and studying these in a stepwise fashion. Others attempt to see the task as a whole, the process being

integrational and relational. Basically, it is still a part versus whole approach to learning. Bruner (1960) has described these different approaches to concept learning as analytic (or partist) and intuitive (or wholist). Svenssen (1977), too, contrasted atomist and holist styles, while Witkin et al. (1977) distinguished between the articulated and global approaches to learning.

One of the most comprehensive and influential studies of learning style in recent years has been that undertaken by George Pask and his associates in England (Pask, 1976a, 1976b, 1976c, 1977). Pask's research has been grounded in a theory of learning which he has developed called Conversation Theory. His analysis involved prescribing the universe of a learning situation within the domain of a conversation between two participants. Although one participant is usually the learner and the other the teacher, sometimes the learner can adopt both roles, and frequently the teacher in a typical Pask experiment is a computer programme. Evidence of learning comes from comments or answers by the learner in a teachback situation, or from what she or he does with apparatus.

In the earlier studies (Pask and Scott, 1972), classificatory tasks pertaining to imaginary Martian animals were given to students. Subjects had to categorize and generalize in a system similar to Bruner's concept attainment method (Bruner et al., 1956). Pask and Scott found that some students adopted a step by step procedure, concentrating on testing out a narrow, simple hypothesis relating to one concept at a time. These Pask called serialists. Other students tended to form more complex hypotheses relating to several characteristics of the organisms. These were called holists and the approach they adopted was similar to Bruner's 'Wholists' (Bruner, 1960). Pask's later work (1976a, 1976b, 1977) introduced experimental control of the learning situation in a highly systematic procedure. In a laboratory situation the presentation of material was standardized through computer presentation. The learner, however, could manipulate the material in different ways, and

everything s/he did was recorded and analysed by computer. Previous studies in learning style, according to Pask, have usually been contaminated by learning outcome because researchers have concentrated on relating style to a dependent variable such as learning performance. To control for outcome, Pask required all subjects to reach a required level of understanding (normally a rather hazy concept, understanding was closely defined and operationalized). The learner demonstrated this understanding by performing set tasks within which the differing approaches of the serialist and holist could be easily manifested and manipulated. For example, the effect of matching and mismatching a teacher's strategy to an individual's learning strategy was investigated. It was found that matched instruction favoured learning and mismatched instruction completely disrupted it (Pask, 1976b). Some students adopted one approach consistently which caused Pask to suggest the strategy / style distinction discussed earlier. The persistent inclination to use a serialist approach he called operation learning, while a similar tendency towards a holist strategy was labelled comprehension learning.

In a later summary, Pask (1977) suggested that either style is incomplete on its own. Indeed, over-reliance on one or the other leads to a learning pathology. For example, a student who adopts an operation learning style exclusively will fail to use appropriate analogies or see complex relationships. This pathology is called improvidence. The corresponding pathology whereby a comprehension learner fails to make a stringent analysis of any of the sub-topics or concepts, misunderstands, or makes vacuous analogies is called globetrotting. A useful analogy might be that the improvident learner can't see the wood for the trees, while the globetrotter can't see the trees for the wood. The presence of either pathology leads to incomplete understanding. Successful learners, then, are those who can avoid both pathologies by having a versatile approach. Those with a versatile style can adopt elements of both the comprehension learning and operational learning styles appropriately.

Pask's procedure is so heavily dependent on complex laboratory equipment and computer technology that it is difficult to test in a naturalistic setting, and is extremely difficult for other researchers to replicate. A portable version of the laboratory conversational domain (CASTE) has been developed and used in schools (Pask, 1976a). This version (INTUITION) has had mixed success. Because it represents an ideal learning environment where understanding is necessarily reached, it has been thought particularly suitable for troublesome topics such as probability theory, and the meiosis / mitosis transformations in biology. Entailment Structures for these topics have been set up, but because laboratory type control is difficult in a school setting (e.g. timetable restrictions, placement and length of learning sessions, frequent interruptions), evaluation of the programme has been difficult. Entwistle (1978) reported from a personal communication with Pask that of a sample of seventy-five students, those working with INTUITION generally reached a full understanding of these difficult topics, while those taught conventionally tended to get less than half the post-test questions correct.

Pask's work is strangely similar to that of B.F.Skinner; strangely, because Pask's Conversation Theory is a long way removed from Skinner's Behaviourist Theory. Yet, in both systems input is controlled, learning is individualized, learning outcome is operationalized, success is guaranteed, and both have developed a comprehensive theoretical framework. Pask is concerned with meaningful understanding, but there is a tight definition of just what this is. Likewise, Skinner defines learning in a very specific sense. Both systems share similar disadvantages in that they operate within their own eco-systems. The natural world of learning has to cope with certain learner variables such as past experience and motivation, which neither system handles well. In other words, it is still a long way from the scientific laboratory to the classroom.

Nevertheless, Pask's contribution in the field of learning style is a significant one, just as Behaviourist Theory is to

learning in general. In a very real way, the process of learning is made visible, and the styles of operation learning and comprehension learning made tangible. Also important is the finding that one style is not intrinsically better than the other, and that in fact both styles are incomplete on their own - a versatile learning style being the mode seen to be most successful (Pask, 1977).

Brumby (1982) did not distinguish between learning style and cognitive style in the sense proposed in the present study. She focussed on how the students in her sample perceived a problem. She found that they perceived problems in either an analytic or holist way, and classified the few students who were inconsistent within or between problems as being versatile. The students' perception of a problem, however, was inferred from how they went about explaining or solving it. Thus, while Brumby labels her constructs cognitive styles, in terms of the distinction made in the present review of the literature, they are really learning styles (i.e. Brumby is concerned not so much with how students process information, but with how they go about solving problems in a consistent or preferred way).

Brumby found that most of her students were analytic (42 percent), or versatile (52 percent). Only 6 percent could be classified as holist. She suggested that this may be a product of students' background. Most of them had studied science subjects extensively at secondary school, and in these subjects an analytic approach is generally needed for success in school examinations. In addition, she suggested that the result could also be an artifact of the method of data collection: students gave qualitative descriptions of how they interpreted information presented in diagrammatic form and in a complex graph; in a third problem they described how they would find out whether a rock-like substance was living or non-living.

Two questions need to be considered to conclude this section on learning and cognitive styles:

1. Is learning style best seen as a single dimension or continuum, or is it multi-dimensional?

2. What is the relationship between learning style and cognitive style?

With regard to the first question it is tempting to see learning style as uni-dimensional and bi-polar. As displayed in FIGURE 2.2 below, the dichotomies mentioned in earlier discussion seem to be referring to the same thing, but using different words - one either focusses on the parts, or on the whole.

	Focus on Parts	Focus on Whole
BRUNER	Analytic (Partist)	Intuitive (Wholist)
WITKIN	Articulated	Global
SVENSSEN	Atomist	Holist
PASK	Operation Learning	Comprehension Learning
BRUMBY	Analytic	Holist

FIGURE 2.2 Dichotomies of learning style.

The work of Pask, Entwistle, and Brumby. however, suggests that a simple dichotomous analysis is not the case. These researchers have all argued for a third style which, after Pask, they call versatile. It is possible, therefore, that there are two discrete styles, with a third being the ability to adopt either. FIGURE 2.3 shows this in a diagrammatic form. The learners at either (A) or (C) have distinctive styles; analytic or operation learning at (A); and holist at (C). The learner at (B) has both styles to a high degree and is versatile. People represented by (A) and (C) in Pask's model would be incomplete as successful learners because they are both subject to pathologies: globetrotting in the case of (A); and improvidence with respect to (C).

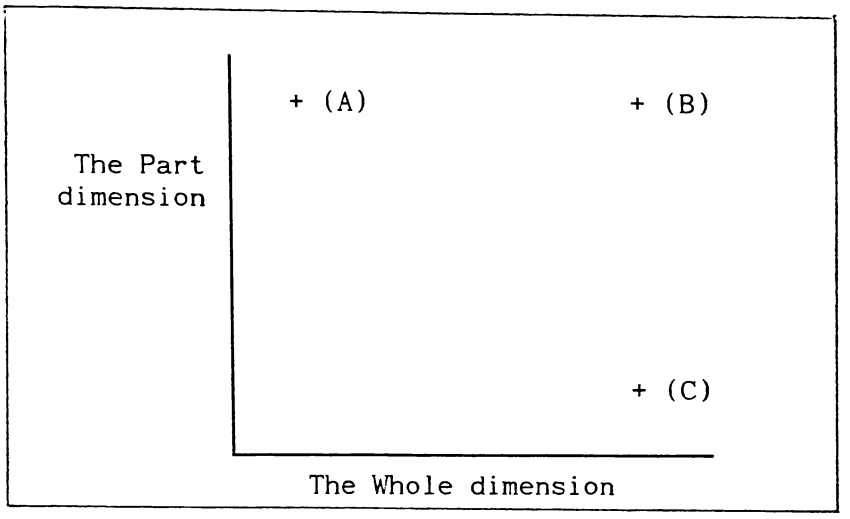

FIGURE 2.3 Dimensions of Learning Style.

Concerning the relationship between learning style and cognitive style, it would be pleasing, if only in terms of cognitive consonance, to demonstrate that the cognitive style dichotomies as listed by Kogan (1971), neatly underpin the dichotomy of learning style listed above. But this is far from being the case. The dichotomies of cognitive style lack consistency even in relation to each other. Kogan & Wallach (1964), for example, found sex differences in the relationship between reflectivity and field independence. Field-dependent women tended to be impulsive and took risks, while Field-independent women tended to be cautious. For males, these tendencies were reversed. Entwistle and Ramsden (1983) report a study by S. Morison whereby a group of sixty students was given the cognitive style tests above, plus a personality inventory, a test of verbal reasoning, Pask's Spy-ring Test, and the Approaches to Studying Inventory. Factor analysis revealed that while field-independence and reflectiveness both had high loadings on a single factor, neither was related to learning style. These cognitive style dimensions were related to the test of verbal reasoning and the test on generalizing. Learning styles, on the other hand, were related to personality factors and the learner's intention, the strongest relationships being that operation learning was linked with a surface-learning approach as well as with syllabus-boundness, extrinsic motivation, and fear of failure. Such findings suggest strongly that any attempt to understand learning at the tertiary level

must take into account not only the intention of the learners, but their habitual modes of information processing and learning styles.

Summary and Comment

Cognitive style and learning style are terms which lack consistency of definition in the literature. A distinction seems to be emerging, however, which led the present review to adopt the following as definitions:

> *Cognitive style refers to a habitual way of processing information.*
>
> *Learning style refers to what a person actually does in a preferred and consistent way in a learning situation.*

Cognitive style, therefore, is an inferred inner process or construct, while learning style refers to a set of behaviours. Learning style is the more inclusive term, and cognitive style is one of the several factors which contribute to it.

A considerable amount of the research on cognitive style has used children as subjects, and in many instances style tends to be confounded with developmental stages which occur with maturity. Little is known about how cognitive style relates to learning in adult subjects.

There is some disagreement as to the value of categorizing learners in terms of cognitive style. It might be reasonable to assume, however, that where a particular style is known to inhibit learning, and such style is amenable to instruction, then such knowledge would indeed be useful. Impulsivity is a case in point. Several studies have related impulsivity to difficulties in learning to read (e.g. Kagan, 1965), and there is evidence that children can be helped to be more reflective (Zakay et al., 1984).

With regard to adult learning, it might be assumed that courses which require a high degree of analytical thinking might best be avoided by students who have a global cognitive style. It would be a brave counsellor, however, who would attempt to guide school leavers into particular courses on the basis of cognitive style profiles -- at least at this stage of our knowledge. The NASSP learning styles task force (Keefe,1985) would seem to be heading in such a direction, but it is more likely that the information gained from such a test battery would be more useful for remedial teaching than for counselling students to enrol for particular courses.

The present review of the research on learning style suggests that in this area, there is less complexity and generally more agreement. People seem to either adopt a piece-by-piece, sequential approach to a learning task, or they attempt a more global, wholistic approach. A third style is suggested which is the ability to adopt either approach. This latter Pask calls a versatile style. Once again questions of utility arise. Does it matter what learning style a student develops? Is one style more effective than another for all students, and for any task?

It seems reasonable to suppose that some learning tasks are more amenable to a particular style. For example, a task which requires a step by step analytical approach (such as diagnosing a fault in a motor) would be more suited to someone with an analytic style. Most learners, however, would find themselves at some time in a situation where their preferred mode is inappropriate. The more general the course of study undertaken, the more likely this would be so. In such cases the learner who is versatile would seem to have the greater advantage. Indeed Pask's research showed that versatile learners were the most successful. Researchers in the field tend to accept Pask's findings as having some generality, although there is very little evidence to support it. Watkins and Hattie's (1983) longitudinal study found some support for the hypothesis that, over time, scores on the Globetrotting scale would decrease, and scores on the Comprehension Learning scale would increase. It is not

clear, however, whether this is really the same thing as saying that the students became more versatile. There is clearly a need for more research in this area.

A recurrent problem associated with research which attempts to weigh the relative effectiveness of learning styles has already been mentioned: that is, the nature of the dependent variable. Usually some measure of academic success is adopted but, as mentioned previously, academic success does not always 'square' with quality of learning.

Several guidelines for research, then, are suggested by the analysis above:

1. Strictly speaking, learning styles can only be studied effectively through a longitudinal research process. This is because, by definition, learning style is a preferred, consistent approach to learning and there is no other way that consistency can be adequately gauged.

2. From longitudinal studies it might be discovered whether students will adopt a more versatile approach as a result of experience.

3. More than one measure of learning style would be advantageous. For example quantitative measures from an inventory could be backed by verbal reports and discriminative tasks.

4. More than one measure of academic success would be appropriate. Course results could be supported by qualitative remarks on essays and oral discussions.

Research Needs

Pask's research suggests that over-reliance on an analytic or holist style will result in incomplete learning; that usually the most successful learners will possess both styles to a considerable degree, which is to say that they are versatile learners.

In order to ascertain whether or not a person is a versatile learner, it would seem to be important that he/she be observed over a range of tasks, rather than from performance on a single task or single class of tasks.

Given the variety of courses that a typical teachers college student takes during his/her preservice programme, it would be expected that students with a versatile learning style would have some advantage. Questions which might usefully be investigated therefore would be:

1. Is versatility a style that can be developed, or is it a relatively fixed trait?

2. Will students who are characterized as having a versatile style early in a programme, turn out to be better learners than the others?

Note: The word used to describe the global style has sometimes been spelled wholist and sometimes holist. This is how it appears in the literature, and the present researcher has attempted to match the spelling with that used by the various authors.

The Developmental Aspect of Adult Learning

It is probably true to say that the general public expect two things of higher education. They expect the student to finish up knowing something 'advanced' about certain subject matter, and also in some general way that the student's mind will be improved. It seems that college and university staff also have this expectation of their students (Percy and Salter, 1976; Entwistle and Percy, 1974). The 'improved mind' notion has been described as post-conventional thinking, or critical thinking:

> "The student moves from the uncritical acceptance of orthodoxy to creative dissent over the values and standards of society..."
>
> (Ashby, 1973, pp. 147-8).

American studies concerned with the impact of higher education on its recipients have tended to emphasise the personality development of the student. They claim, for example, that students attain a higher level of maturity, self-actualization and ego-identity (Feldman, 1972), and increased hedonism, decreased interest in business and decreased religiousness (Astin, 1977). A major problem with such research, however, has been the inability (a virtual impossibility according to Feldman) to establish that the effects are unambiguously due to higher education. Another difficulty is that research in higher education is predominantly cross-sectional in nature, and the difficulty in interpreting cross-sectional studies in terms of developmental factors are well recognized. Feldman (1972) and Brabeck (1983) point to the need for longitudinal studies in this area.

Two longitudinal studies of development in student academic learning were undertaken in the 1950's at Princeton and Harvard Universities respectively (Heath, 1964; Perry, 1970). These studies are of considerable importance because they lend support to the 'improved mind' belief about student development, and describe in some detail the ways in which students' minds seem to improve.

Heath, a clinical psychologist at Princeton, began his study in 1954 of 36 randomly selected students matched with controls. He was able to categorize beginning students into one of three major types: Non-committers, Plungers, and Hustlers. The non-committed students, as the name suggests, attempt to avoid involvements; these students see making a commitment as a premature cutting of their options, a stance that may be a rationalization along the lines: "I could have got an A, of course, if I'd really gone all out --- but who wants to go all out?". Non-committers carefully avoid putting themselves to the test of going 'all out' because they are secretly afraid of failure.

Hustlers are out to impress. Possessed of a high need for achievement, they are highly competitive, and are generally looking for approval.

Plungers wax hot and cold, enthusiastic one moment only to be depressed the next. Projects are started with great enthusiasm but are soon dropped.

According to Heath, these three beginning student types reflect basic personality types. In terms of cognitive development, however, the important finding is that regardless of personality type, almost all students move towards an ideal type over the course of their three years at college. This ideal type Heath called the Reasonable Adventurer. The Reasonable Adventurer is characterized by five attributes:

1. Intellectually close friendships.
2. Independence in value judgements.
3. Tolerance of ambiguity.
4. Breadth of interests.
5. Sense of humour.

The other key longitudinal study of student learning and development was started at Harvard in 1954 by Perry, although it was not published until sixteen years later (Perry, 1970). Perry

interviewed each of 67 students once in each of their four years of Harvard residence. Each interview began with an open question: "What stands out for you about this year?" Analysis of the transcripts led Perry to view student progress through College as a gradual shift from having fixed attitudes about knowledge towards what he calls relativistic reasoning. Nine discrete stages were identified:

1. The student believes that right answers for everything exist, and that it is the role of authority to give such knowledge to the students.

2. The student perceives some diversity of opinion, but puts this down to some authorities being less competent than others.

3. The student agrees that some diversity is legitimate, but this is simply because they have not found the right answer yet.

4. The student's acceptance of legitimate diversity of opinion and uncertainty is generalized to the belief that "Everyone has a right to his or her own opinion, and my opinion is as good as anyone else's."

5. The student perceives all knowledge and values, including those of authority, as contextual and relativistic.

6. The student feels the need to come to some personal position through commitment in some area.

7. The student makes a commitment in some area.

8. The student experiences the implications of commitment and explores the subjective and stylistic issues of responsibility.

9. The student experiences the affirmation of identity among multiple responsibilities and realizes that commitment is an on-going, unfolding activity through which he or she expresses his/her life-style.

(Perry, 1970, pp.9-10)

Heath and Perry both give a picture of the end product of a university education as being a person who has developed in an ideal way in how he or she thinks and views the world - a person

who is self-actualized. The studies have high face validity because every tutor and lecturer has met students just like those described - which is possibly why the studies have had rather uncritical acceptance. Despite their use of fairly small samples of resident students in Ivy-League colleges, few people have any difficulty in accepting the finding that there is a general development in students from a sort of naive realism towards relativistic reasoning. Perhaps the greatest weakness in Heath and Perry's work, however, is that they say nothing about how their subjects actually approached their learning tasks.

Although the Heath and Perry studies are now rather dated (there have been dramatic changes in the student milieu in the last twenty years), support for Perry's theory of student development comes from a recent review of three longitudinal studies by Brabeck (1983). Brabeck supports the view that students tend to mature intellectually throughout their college years, this development following a sequence predicted by Reflective-Judgement theory (Kitchener and King, 1981) which has its roots in Perry's work. The Reflective-Judgement model proposes seven stages similar to Perry's, whereby the student progresses from Stage 1 (reality is known with certainty) to Stage 7 (some knowledge claims can be judged as better or more likely to be correct than others, weight of evidence making them more compelling).

Critique of the Stages View of Development.

The stages/developmental view of students' progress through university has been challenged in a recent longitudinal study of the learning processes of students at the Australian National University (Watkin and Hattie, 1983). These authors note that, as yet, there is no evidence of contextual or individual factors which might impede or accelerate such growth in students, and they draw attention to the point made by Lawson (1983) that the difference between undergraduate and graduate students in Kitchener and King's 1981 study might have been due to a

combination of age, selection and educational experience. The Watkins and Hattie research has special relevance for the present study, and it is therefore described in some detail below.

This Australian study began in 1980 when the Approaches to Studying Inventory (Ramsden and Entwistle, 1981) was completed by 540 first year students at the Australian National University (Watkins, 1982a). Significant differences were found in student learning processes according to age, faculty and sex. Older students, and Arts rather than Science and Economics students, were more likely to claim that they utilized a deep-level approach. Female students scored more highly on Fear of Failure, Operation learning, and Improvidence sub-scales, and on the Surface-confusion and Operation-learning orientations (Watkins adopted different terminology for Factors II and III of the ASI factor structure because of some differences in the loadings that the Australian sample produced).

Sixty students selected for interviewing comprised the ten highest scorers on each of the Meaning and Reproducing orientations for each of three faculties: Arts, Science and Economics. Subjects were asked to describe how they went about studying in general, and also talked specifically about how they approached a recently completed task. In this first stage it was found that a deep level of processing was not significantly related to the grades these students obtained but was strongly related to the quality of learning as determined by the SOLO ratings (The SOLO Taxonomy, Collis and Biggs, 1982).

The second stage of this study was a follow-up on some of the original subjects at the end of their third year. Only 370 of the original 540 students were still at university, and of these only 244 consented to participate in the follow-up. These students completed the ASI, a 15 item cognitive processes questionnaire, and a 24 item tertiary attribution of achievement questionnaire (Perry, 1982). Subjects were also asked to respond to two open questions:

1. Do you feel your approach to study has changed since your first year at ANU?

2. What factors influence your present approach to study?

Students who were non-respondents in the follow-up were categorized as either Non-persisting (no longer at university), or Persisting Non-responders. The first year data was re-run on that basis. Persisting students (i.e. including the Persisting Non-responders) differed from students who had withdrawn from university on the ASI sub-scales Disorganized Study Methods and Negative Attitudes to Study (students who persisted tended to report better organized study methods and less negative attitudes to study).

Gender and faculty effects were still significant at the end of the third year, but the age effect had disappeared. Females and Arts students were significantly higher on the Relating Ideas sub-scale, while Economics students were more syllabus bound and scored higher on achievement motivation. A repeated measures analysis showed that only the main effects were significant, indicating that these differences were independent of sex, age, and their interactions. Means for the ASI sub-scales of the persisting respondents in Years One and Three are given in TABLE 2.5. Of special interest is the overall significant decrease in the Meaning Orientation over time, apparently attributable to decreases in the sub-scales Deep Approach, Use of Evidence, and Intrinsic Motivation. The means for the Negative Attitudes sub-scale showed a significant increase, and there was a non-significant increase in Versatility. An analysis revealed that the ASI factor structure was invariant over time. No relationship was found between locus of control and any of the ASI sub-scales.

Sixty-four percent of the students interviewed reported changing their approach to studying. The changes were along the lines of increased efficiency, and knowing what was wanted. A

TABLE 2.5 ASI means for persisting students in years one and three (Watkins and Hattie, 1983).

Approaches to Studying Inventory sub-scales	1st year	3rd year
Meaning Orientation		
Deep approach	11.41	11.06
Relating ideas	10.50	10.76
Use of Evidence	9.74	9.67
Intrinsic Motivation	9.79	9.55
Reproducing Orientation		
Surface Approach	11.97	11.99
Syllabus-bound	7.77	7.59
Fear of Failure	5.47	5.95
Extrinsic Motivation	6.63	5.64
Achievement Orientation		
Strategic Approach	10.44	10.90
Disorganized Study Method	8.61	8.86
Negative Attitudes	5.18	5.76
Achievement Motivation	8.13	7.98
Holistic Orientation		
Comprehension Learning	8.68	8.89
Globetrotting	7.04	6.97
Operation Learning	10.35	10.15
Improvidence	6.91	6.88

slight overall change from Surface Level to a Deep Level approach was noted, but there was increased cynicism as to the value of tertiary study. The factors which appeared to influence students' approaches to study were straightforward: student interest in the subject matter, and whether the lecturer was boring or enthusiastic.

Overall, the study provided little evidence that the learning processes of the students had improved in the sense of their becoming deeper or more versatile. Neither was there development in the Perry and Heath sense of self-actualization. This is disturbing when one considers that almost 50 percent of the original student sample were not included in the follow-up. It might be fairly assumed that many of the disillusioned and

unsuccessful students had already left the university, so the results obtained were from mainly interested and successful students. Watkins and Hattie (1983) have noted that the bias resulting from subjects dropping out is an inherent problem in longitudinal research; moreover, that a simple comparison of those who withdraw with those who participate is unsatisfactory because, included in the withdrawing group are those who are still at university but for some reason decide not to participate in the research. As mentioned earlier, Watkins and Hattie re-ran their first year data taking these three groups into account. The results supported the claim that ignoring persisting Non-responding subjects could seriously affect the validity of longitudinal research.

Summary and Comment.

Consequent upon the general acceptance of Piaget's theories of child development, a popular belief seems to have arisen that intellectual development is basically completed by adolescence; that all that remains is a sharpening and application of these abilities and skills, and a generalization of these to wider content areas (Labouvie and Vief, 1982). Research over the past two decades, particularly in America, has suggested that further development does take place, the basis for which is a change from naive-realism to a relativistic approach to knowledge. It is proposed further that for many people formal operational thought may not be achieved by adulthood, and indeed may not mark the final stage of intellectual development (Kitchener and King, 1981). Thus adult learners may continue to change with respect to further development of formal operational thought, and in ontological development. The work of Watkins and Hattie (1983), gave little support to the latter, and instead painted a rather disturbing picture of how university students at the Australian National University develop intellectually.

The fact that a significant number of students in the Watkins and Hattie study admitted disillusionment with university and

expressed negative attitudes towards studying, is a most important finding. It stands in marked contrast to the Heath and Perry findings, and possibly also with the ideas that many university faculty members would have about the quality of their end product. Watkins and Hattie suggested that one reason for the discrepancy could be that a considerable number of the students in their research sample perceived that deep-level strategies (associated with intrinsic motivation, being syllabus-free, and the ability to relate ideas) are not required and, in fact, may even inhibit the chances for success in examinations.

A number of reasons may be suggested to explain the discrepancy between the American and Australian research. First, the American studies are phenomenological in approach, being based primarily on interview data. Second, their samples are small and represent a rather select type of student. Third, the longitudinal nature of the research also has the typical weakness of confusing historical with personal development. Fourth, the educational milieu has changed considerably in the past 20 years.

The Watkins and Hattie research had a methodological limitation with respect to the number of points at which data was gathered during the three years. The longitudinal design consisted of two administrations of the ASI (at the end of the first and third years) and one set of interviews with a substantial sample of students half way through the second year. The number of points at which data, from either interviews or questionnaires, may be collected is obviously limited by he size of the research population and the resources at the disposal of the researcher. To obtain more data gathering points, which would be desirable, one would need either a smaller research population or greater resources.

Finally, Watkins and Hattie were looking principally for changes in the learning process, whereas the the American studies focussed more on general personality and cognitive changes.

Research Needs.

There is a great need for further research in the area of the developmental aspect of adult learning. It would be interesting, for example, to compare findings in the Australian research with a New Zealand sample.

1. Would the motivation and attitudes of New Zealand students towards studying and learning follow a developmental trend similar to that of the students described in the Heath and Perry studies or would they reveal a lack of such development -- or even negative development similar to that of students at the Australian National University in the Watkins and Hattie research?

2. Would New Zealand students become better learners in the sense of learning how to learn or would they, like their Australian counterparts, simply become more efficient at giving what they perceive their lecturers want?

3. What indicators of personality and cognitive change would emerge in a longitudinal study spanning three years?

4. What factors would appear to underlie such changes?

The Context and Content of Learning.

The verb TO LEARN not only has a subject (the learner), but an object (the 'something' or content that is to be learned). Learning, furthermore, does not occur in a vacuum, but must take place within some framework of time and place. Both context and content are important variables that will influence how a student will approach a learning task.

Mainstream research in social science has traditionally seen

context as something to be carefully controlled. In Pask's research, on learning styles and strategies, for example, it is recognized that there are problems in transferring the approach used to learning in the classroom, the resolution of the problem seeming to be making the classroom as much like the laboratory as possible (Pask, 1976a). The effects of the different contexts themselves are not seen as variables to be explored. Even in the naturalistic setting typical of the Gothenburg studies (see earlier), the context is controlled: students study the same material, under the same instructions, and the material is reviewed in similarly structured interview situations.

One of the first attempts to study learning in a natural setting where context could be a variable was made by Laurillard (Laurillard, 1979). In this study Laurillard held two conditions to be particularly important:

1. The learning task should be part of the student's normal coursework (she got students to talk about a task on which they were presently engaged, how much of it they understood and how they were going about it).

2. The student's approaches to learning ought to be studied across several tasks, not just one.

Laurillard's main finding was that the styles and strategies adopted by students were largely context dependent. Only 12 out of the 31 subjects used a similar approach across different tasks, and the nature of the task itself was seen to be a factor contributing to the adopted style. Some tasks seemed to elicit an operation learning style, while other tasks did not. Because the subjects were all science students (perhaps from the same class), the tasks they chose to describe to the interviewer were often the same.

The perception of the learner was another factor that influenced the adoption of a particular style or strategy, in

particular the learner's perception of the task and of the teaching style. The way in which learners perceived a task, and the relationship this had to the approach adopted, is summarized in FIGURE 2.4 (perception of the task is in terms of how the student perceives its purpose).

Perception of Task	Approach to Learning	
	Deep approach	Surface Approach
Why am I doing this?	For its own sake. It is intrinsically interesting.	It's just something that has to be handed in
What will I get out of it?	Better understanding	A pass.

FIGURE 2.4 The relationship between perception of task and approach to learning (adapted from Laurillard, 1979, p.140).

With respect to students' perception of teaching style, Laurillard found that if students perceived that the teacher was trying to help them relate the material to reality, or, was providing them with the opportunity to engage in comprehension learning, a comprehension learning style was more likely to be adopted.

Ramsden (1979) used a different approach to investigate students' learning environments. Interested in seeing how students perceived the departments in which they were enrolled, he developed a Course Perception Questionnaire (CPQ) with the aim of probing various dimensions of university departments that could have a bearing on how students approached learning. The CPQ has eight sub-scales (see FIGURE 2.5).

Ramsden and Entwistle (1981) investigated the effects of academic departments on students' approaches to studying. The CPQ and the ASI were administered to 2208 students drawn from 66 academic departments in six contrasting disciplines. Factor analysis revealed some fairly clear relationships. A Reproducing Orientation was related to heavy workload. An Achieving

	SUB-SCALE	DESCRIPTION
1.	Staff-student relationships	Are staff aloof or friendly? Helpful or non-helpful?
2.	Staff commitment to teaching	Are staff enthusiastic? Do they teach at an appropriate level?
3.	Student workload	The number, length, frequency of, and time allowed for assignments.
4.	Teaching methods	Formal-informal
5.	Vocational relevance	Perceived relevance of course for students' future careers.
6.	Social climate	Frequency and quality of social and academic relationships
7.	Clear goals and standards	The extent to which standards expected are clear and unambiguous.
8.	Freedom in learning	The amount of choice a student has in selecting and organizing academic work.

FIGURE 2.5 Course Perception Questionnaire sub-scales. (Ramsden and Entwistle, 1981.)

Orientation was related to having clear goals and standards. A Meaning Orientation was related to good teaching and freedom in learning. Interview data supported the correlational analysis. For example:

> If they, (the tutors) have enthusiasm, then they really fire their students with the subject and they really pick it up."
>
> "I'm really good at and enjoy (one subject) but that's only because a particular tutor I've had has been so enthusiastic that he gave me an enthusiasm for it and now I love the subject."
>
> (Entwistle and Ramsden, 1983, p. 169)

Summary and Comment

The research outlined in this section indicates that a learner's approach to a task depends to some extent on the nature of the task (content), the learner's perception of the purpose of the task, and on the context (as illustrated by characteristics of the faculty or department in which the student is studying).

The nature of a learning task will certainly have some bearing on the approach adopted by a learner. This is obvious when one considers extreme examples such as it being rather difficult to approach the learning of a string of digits in a meaningful way, or to adopt a reproducing approach to a task which requires the explanation of something in one's own words. In the context of higher education, however, tasks are rarely so simple or unidimensional; they tend to be complex and require a wide set of cognitive abilities.

Laurillard's finding that most students in her sample did adopt different approaches to different tasks, even when these tasks were all in the domain of science, has important implications. It raises the issue of generalization of findings from research based on a single type of learning task. The Gothenberg studies, for example, suggest conclusions about student approaches to learning based on their performance on a single task - the studying of academic articles. While interview questions can probe a student as to how s/he generally goes about learning, the fact remains that students in the Gothenberg research programmes were classified as deep or surface learners on the basis of their performance on the single type of task. To compare student approaches to learning across a variety of tasks should involve some form of task analysis on recognized criteria such as Bloom's taxonomy or Gagné's classification of learning. In this way the relationship between the level of cognitive activity required and student approaches could be better studied.

Research which relies on questionnaire data to identify student approaches to learning is also problematic when it comes

to the issue of generalization. Instructions for the ASI, for example, ask students to respond to the questionnaire in terms of how they usually go about studying. If a student, however, is engaged in a course of study where the courses are fairly heterogeneous in nature (as, for example, is the case in a teacher education programme, or even in a Bachelor of Arts degree), respondents may have difficulty in responding to some of the items because they approach different subjects in different ways.

As Laurillard discovered, how students perceive a task will also influence how they will approach it, This factor is possibly more complex than Laurillard's report indicates, however, linked as it is with the whole issue of student motivation.

The influence of context on student learning is well illustrated by the work of Ramsden and Entwistle using the Course Perception Questionnaire. Their findings have clear implications, not only for university teaching, but for all centres of higher learning. Teachers at all levels need to be more aware that what they, the teachers, do can influence how students go about learning in ways that may be unproductive or even damaging.

Finally, it must be stressed that while the factors of content, context and student perceptions of the learning task are discussed in this section as separate entities, in fact they interact and have a combined effect on student learning.

Research Needs.

Questions concerning the relationship between learning strategy and the nature of the task have already been considered at the end of the section dealing with the learners' intention. A specific issue arising from the above discussion, however, relates to the method one uses to determine what a student's

approach to learning is. It is problematic whether there is any consistency between the Gothenberg method of asking students during an interview how they went about a specific task, and the questionnaire method which infers a student's general approach from his/her responses (usually restricted in some way) to a set of questions. Combining interviews and questionnaires in a longitudinal study may resolve this issue.

Quantitative and Qualitative Approaches to Learning Process and Outcome

While the purpose of this section is to discuss quantitative and qualitative approaches to learning process and outcome, a brief summary of the application of both approaches to research in general will assist in clarifying the main discussion.

Quantitative methods, with their emphasis on measurement and hypothesis testing, have been the mainstream methodologies in psychology, education, and sociology for most of the twentieth century (Boring, 1957; Bruyn, 1966; Rist, 1977). Proponents of qualitative research (Bogdan and Biklen, 1982, for example), point out that while qualitative research has long been regarded as unscientific and not quite respectable, major studies in anthropology and sociology in recent years have led to a gradual growth in its acceptance.

Even so, there are fundamental philosophical differences in the two research approaches that reflect the way each views reality. For quantitatively orientated researchers, reality is something existing separately from ourselves -- there <u>is</u> a world of external, objectively knowable facts. In the physical sciences this realist orientation has been relatively unproblematic. Even in the social sciences many researchers have little difficulty in conceiving of an independently existing

social reality that can be described as it really is. The qualitative approach, on the other hand, adopts a phenomenological view of reality (e.g. Rogers, 1951, 1969) which holds that phenomena can only be knowable by interpretation, and that interpretation is relative to the perceiver. Reality is thus constructed by each individual for him or herself.

Bogdan and Biklen (1982) use the analogy of a motor accident to illustrate the difference between the two approaches. The realist or quantitative view is that there is a correct sequence of events which ought to be able to explain unambiguously what actually happened. If two witnesses differ in their account of what happened, then one of them at least is mistaken. It is as if there were a 'God's-eye view' (Smith and Heshusius, 1986). The qualitative or phenomenological view is that the accident can be interpreted in many (even conflicting) ways, and that all of them may be 'correct'. There is no such thing as a 'God's- eye view'; there can only be various peoples' points of view based on their particular interests, values and purposes.

These philosophical differences give rise to differences in procedures and methods, some of which are evident in the following list of the main features of qualitative research outlined by Bogdan and Biklen:

> (1) "Qualitative research has the natural setting as the direct source of data and the researcher is the key instrument.
>
> (2) Qualitative research is descriptive i.e. the data is in the form of words or pictures rather than numbers.
>
> (3) Qualitative researchers are concerned with process rather than simply with outcomes or products.
>
> (4) Qualitative researchers tend to analyse their data inductively.
>
> (5) Meaning is of essential concern to the qualitative researcher."
>
> (Bogdan and Biklen, 1982: pp. 27-30).

Marton and Svensson (1979), in discussing the problem of describing extent (a characteristic of quantitative methods) or of describing kind (which is the main feature of qualitative methods) make two important points:

1. When the quantitative model is used to measure some quality, it is generally assumed that what the quality is, is known. In measuring intelligence or introversion, for example, it is assumed that we know what intelligence or introversion is, and the only problem is to find how much of it there is. As Marton and Svensson put it:

> "The nature of what is being measured tends to be considered relatively unproblematic and capable of being defined in terms of an instrument applicable in varying contexts."
>
> (Marton and Svensson, 1979, p.476)

2. In traditional research, qualitative descriptions are not regarded as results per se but as steps towards obtaining the quantitative outcome such as the testing of hypotheses, or the finding of correlations. In other words, the two kinds of descriptions are generally seen as phases within a research programme.

Marton and Svensson make a strong plea for qualitative outcomes to be considered as results in their own right. Qualitative descriptions, according to these authors, may be categorized, and these categories themselves can help us to understand the learner and his/her world. This is a viewpoint shared by other advocates of the qualitative approach (e.g. Bogdan and Biklen, 1982; Rist, 1977).

The first point above refers to the question of validity i.e. whether the various research instruments do in fact measure what the researcher thinks they are measuring. This point has particular relevance to research which adopts as a procedure, the measurement of student learning styles and motivation.

With regard to the second point raised by Marton and Svensson, qualitative descriptions are increasingly accepted as results in their own right. The debate has given way to detente (Smith and Heshusius, 1986).

The question which is most at issue today, however, is whether the two approaches are able to be combined in a single research project. Bogdan and Biklen (1982) warn against this, pointing out that there is a danger that one may end up with research which does not meet the requirements of either. Smith and Heshusius (1986) also insist that research should be either the one or the other approach. They argue that the differences in principles and underlying philosophies make the two approaches incompatible.

Other researchers see advantages in combining the two methodologies. Entwistle and Ramsden (1983), for example, supplemented the quantitative data obtained from questionnaires, with the Gothenberg procedure of analysis of student verbal reports on how they went about learning an academic article. Watkins and Hattie (1983) also combined questionnaire data with reports obtained from interviews in an attempt to gain a more complete picture of the learning processes of their Canberra students. The results from both these studies seem to support the view that the combination of quantitative and qualitative data can be profitable in terms of adding richness to the data, and also by way of increasing validity when one set of results complements the other.

The position adopted by the present writer is that combining the methods could result in fruitful, valid research if a researcher can adopt a neutral stance with respect to the philosophy underlying each methodology; if s/he can be objective in regarding methodologies as tools rather than being an integrated part of him or herself (a stance, of course, which the phenomenologists would probably consider impossible); and if the researcher is able to apply the restraints and criteria pertaining to the procedures related to each approach appropriately.

Quantitative and qualitative approaches to educational evaluation.

Learning is a covert process which can only be inferred from some performance. The behaviour which is taken as evidence of learning may be referred to as the learning outcome. Bruner (1964) suggested two criteria by which learning may be judged: (a) retention, and (b) transfer.

Retention is relatively easy to measure, being mainly a question of how much is remembered. Transfer, or being able to utilize what has been learned in new situations, is much more difficult to quantify. In this case we are essentially concerned with how well the learner has integrated new material into his/her existing cognitive structure. We are concerned with the quality of the learning, not the quantity.

The adjectives 'quantitative' and 'qualitative' are applied not only to general research methodologies, but to evaluation procedures used to measure learning. Quantitative methods are applied appropriately when the quantity of learning is a desired outcome, and qualitative methods are appropriate to the measurement of learning quality.

For a variety of reasons many teachers, schools, and education systems stress quantitative evaluation: questions are easier to set, and marks are more easily allocated and reliably counted; the approach lends itself also to short-answer, multiple-choice type tests which, as well as being more speedily marked, are more reliable in the sense that different markers are more likely to arrive at the same score. A serious problem arises, however, when the method of evaluation is out of step with the teaching objectives. Most academics see qualitative elements (e.g. increased rational and critical thinking) as important outcomes of a College education (Entwistle and Percy, 1974; Percy and Slater, 1976; Keeley, Brown and Kreutzer, 1982), yet may use evaluation methods which are inappropriate to the measurement of these objectives.

The measurement problem in terms of educational evaluation applies also to research in learning. The results of learning experiments tend to be expressed in terms of how much is learned as the dependent variable, because the data are easily quantified and thus more amenable to statistical analysis. The researcher, therefore, must be careful not to assume that academic grades obtained by quantitative methods are necessarily a good indication of the quality of learning. It was discussed earlier in this review how good grades may be obtained by students adopting a mainly reproducing approach to learning.

The Qualitative Approach to Learning Process and Outcome.

The Gothenburg studies discussed earlier (Marton and Säljö, 1976a, 1976b; Svensson, 1977; Fransson, 1977) typify the qualitative approach with their research into the learning strategies of adult students. The learning tasks were ones typically required of students, and students went about learning in a natural environment. The descriptive data obtained by means of interviews represents the researchers' attempts to view learning through the eyes of the learner, rather than from the perspective of the researcher.

The responses students made during interviews were analysed and placed in categories, independent judges providing a reliability check of the categorization. By this means the Deep and Surface approaches to learning were manifested. These levels of processing had some generality, since similar categories emerged when working with students from other faculties, and with different learning materials (Ramsden 1979).

When it comes to describing learning outcome, the Swedish studies are consistent in their adoption of a qualitative approach. Student responses are not put into pre-determined categories, but the categories emerge from student responses. For example, Marton and Säljö (1976a) required students to study an article dealing with the effects of education on society. All students were given the same open question designed to elicit

their understanding of what the author was trying to say. Four levels of response quality were determined, and these were simply labelled A, B, C and D, with a description in terms of the text used to describe each level. The levels of understanding were hierarchical and were shown to be related to the level of processing. Because these levels of understanding were text-dependent for their meaning, they were unable to be used as categories for measuring levels of outcome derived from other learning tasks.

Collis and Biggs (1982), however, have attempted to provide such a general measure of level of outcome. Originally concerned with providing teachers with examples of thinking at the various Piagetian levels of cognitive development, the end result of Collis and Biggs's research was a taxonomy which seemed to provide a means of measuring learning quality -- the SOLO Taxonomy (Structure of Observed Learning Outcomes). Subjects in their study attempted to learn the meaning of, and make judgements about, some finite display of information such as a piece of prose, or a poem, map, moral dilemma, or mathematical problem. Subject responses were categorized at five levels:

Level 1. Pre-structural. The response has no relationship to the display, being based on non-comprehension, tautology, or idiosyncratic relevance.

Level 2. Uni-structural. The response contains one relevant item from the display, but misses others that might modify or contradict the response.

Level 3. Multi-structural. The response contains several relevant items, but only those that are consistent with the chosen conclusion are stated. Closure is selective and premature.

> Level 4. Relational. Most or all of the relevant data are used, and conflicts are resolved by use of a relating concept that applies to the given context of the display which leads to a firm conclusion.
>
> Level 5. Extended abstract. The context is seen as only one instance of a general case. Questioning of basic assumptions, counter examples and new data are often given that do not form part of the original display. Consequently, a firm closure is often seen to be inappropriate.
>
> (Collis and Biggs, 1982, p.61).

As described above, the SOLO Taxonomy is fairly similar to the levels described by Marton and Säljö (1976b). Their descriptions of responses typical of each of their four levels fit quite easily into the SOLO Taxonomy. The taxonomy is also functionally close to Bloom's Taxonomy (Bloom et al., 1956).

The SOLO Taxonomy has proved to have considerable utility in the research on learning styles and strategies, particularly when these are related to outcome. For example, Watkins (1983b) found that depth of processing was related to quality of learning as measured by the SOLO Taxonomy. Van Rossum and Schenk (1984) found also that a high quality of learning outcome must be especially associated with a Deep-level approach.

One disadvantage of the SOLO Taxonomy is that the level of outcome is derived from a single display whereas in most situations in higher learning the learner has to deal with multiple displays. It is the present writer's experience, for example, that in practice some essays are difficult to categorize into a SOLO level because the essay may have discrete sections.

The Quantitative approach to Learning Process and Outcome.

Typically, attempts to quantify aspects of the adult learning process and outcome have been made through the medium of questionnaires or inventories (Biggs, 1978; Schmeck et al., 1977; Entwistle and Ramsden, 1982). The procedure usually involves three broad stages:

1. The researcher identifies key learning processes.

2. Items are constructed to describe these, and a questionnaire is developed.

3. The instrument so developed provides a measure of the processes, and also a measure of major orientations that are suggested through factor analysis.

Thus Schmeck et al. (1977) began by identifying key learning processes described in information-processing and verbal-learning texts (processes such as encoding, retrieval, and storage are examples). True-false items were then constructed, such as:

> "I learn new words and ideas by associating them with words and ideas I already know." (T / F)

Factor analysis of the Schmeck inventory produced four factors, namely, Synthesis - Analysis, Study Methods, Fact Retention, and Elaborative Processes. The final version of the instrument is the Self-report Inventory for Assessing Individual Differences in Learning Processes.

Biggs's Study Behaviour Questionnaire (1978), and Entwistle and Ramsden's Approaches to Studying Inventory (1983), were developed in a similar fashion to the Schmeck et al. instrument, except that their items are Likert-type rather than true-false. Biggs found three second order factors: Internalising, Reproducing, and Organising. Entwistle and Ramsden found four factors: Meaningful Orientation, Reproducing orientation, Achieving-strategic, Disorganised and Dilatory.

The similarity in the descriptions of some of these factors such as Reproducing and Meaningful suggest major dimensions of the study process. Indeed, an earlier section of the present review describing the intention of the learner (see pages 9-11) dealt with these inventories. As a group, such inventories tend to be broad-based, tapping many hypothetical variables in the learning process. The ASI scale (Entwistle and Ramsden, 1983), for example, attempts to encompass the work of Parlett, 1970; Marton, 1975; Marton and Säljö, 1976a, 1976b; Pask, 1976a, 1976b; Biggs, 1978; Miller and Parlett, 1974, and others.

The main disadvantage of these attempts to quantify learning processes is that they are subject to the problems of reliability and validity which dog all questionnaires, no matter how sosphisticated their construction. The broad sweep attempted by such instruments only exacerbates the problem.

An Integrated Approach

Some proponents of both the qualitative and quantitative approaches to the measurement of learning-process variables concede that neither approach alone can be viewed as complete (Marton and Svensson, 1977; Entwistle and Ramsden, 1983). Qualitative approaches tend to be task-dependent and describe kind rather than degree. Inventories, besides the problems of reliability and validity, cannot produce the underlying qualifications and meaning that an interview can reveal. Attempts to combine both approaches have already been described (Entwistle and Ramsden, 1983; Watkins and Hattie, 1983), and the objections to the combining of the methodologies has also been referred to earlier (Bogdan and Bicklen, 1982; Smith and Heshusius, 1986).

It seems that a good case can be made for an integrated approach, provided that appropriate safeguards are taken to protect the integrity of each.

Summary and Comment.

For a considerable time, quantitative and qualitative approaches to research have been considered incompatible. Indeed researchers adopting a qualitative approach have had a struggle to have their work accepted as respectable and credible by others outside their own persuasion. Fundamental philosophical differences, particularly with respect to phenomenology, naturally led to the development of different procedures and general methodology. These have been described briefly in this section.

During the past decade qualitative research has come to be widely recognized as legitimate and valid research producing results which stand alone. Although the debate has resulted in a climate of increased mutual respect and acceptance, there is still some resistance to the idea of complete compatibility. Some adherants of the qualitative approach resist combining the methodologies. They seem dismayed by what they regard as either a 'sell-out' to parallelism (the attempt to apply quantitative criteria to qualitative research), and/or the development of an attitude among some researchers that it does not really matter (Smith and Heshusius, 1986).

The study of learning has two important facets: the actual act or process of learning, and the outcome or final result of learning. With regard to the process of learning, the qualitative approach is exemplified in the Gothenberg studies, and in the work of Laurillard (1979) and Brumby (1982). The quantitative approach is exemplified in the early work of the Lancaster group, Biggs (1978) and Schmeck et al. (1977).

With respect to the measurement of learning outcome, one may be concerned with the measurement of extent (how much?), or of kind (what quality?). The quantitative approach has generally been dominant because the focus is usually on how much has been learned. This is partly because the question "How much?" is more easily answered.

It is increasingly being recognized, however, that different learning objectives may require different approaches to the evaluation of outcome. When the quality of learning is a desired outcome, quantitative methods alone are inappropriate. Marton and Säljö (1976a) and Collis and Biggs (1982) have produced categorization systems which attempt to measure quality of learning outcome.

The issue which seems uppermost today is whether or not the two approaches are compatible. The Entwistle and Ramsden (1983), and Watkins and Hattie (1983) studies are examples of research where the two approaches have been combined. These researchers, along with others (e.g. Marton and Svensson, 1977), suggest that neither approach alone can provide a complete picture of student learning.

Conclusion

Throughout this review each discussion section has concluded with a statement on research needs that were suggested by the analysis of the literature. For the first four sections, these needs (which are summarized below), guided the present researcher in the formulation of a more specific set of research questions that had special reference for students attending Hamilton Teachers College. Research needs arising from the two sections context and content, and, the quantitative and qualitative methodologies, influenced the general research design.

Learner Intention	the stability of the learner's intention
	learner intention and academic achievement

Learner Motivation	motivation and its relationship to approaches to studying and learning
	motivation and its relationship to student performance
Styles and Strategies	the development of learning styles
	learning styles and academic attainment
Student Development	cognitive development in young adults, the nature of this development
	the effect of tertiary experience on this development

CHAPTER THREE

RESEARCH METHOD: THE PHASE 1 RESEARCH DESIGN

The concerns expressed in the introduction, together with problems raised in the course of the review of the literature, gave rise to major research questions concerning the study strategies and motivation of students in the preservice programme at Hamilton Teachers College. Analysis of the findings for these questions not only suggested a need to explore them further, but additional themes for investigation. Thus the research comprised a two-phase design. The present chapter describes the research questions and design for Phase 1 of the research. Chapter Four presents the research questions and design that guided the second phase of the study.

The Research Questions

As listed below in FIGURE 3.1, the research questions directing the Phase 1 design were able to be grouped around four general themes: (1) learner intention with respect to study strategies; (2) learner motivation; (3) learning style; and (4) general cognitive development.

With respect to student cognitive and affective development at the tertiary level, the literature review in Chapter Two revealed two major research needs:

1. There is a need for in-depth longitudinal research for the full period of an undergraduate degree or diploma. By in-depth is meant something a good deal more than just the collection of data at the beginning and end of a college programme.

QUESTION	THEME
1. To what extent will there be variability with respect to study strategies? 2. Will there be a general trend with respect to approaches to learning - such as a trend to--wards an increase in deep--level processing? 3. How are the different approaches to studying related to academic success?	LEARNER INTENTION WITH RESPECT TO STUDY STRATEGIES
4. What relationship, if any, will there be between learning strategies and student motivation? 5. Which of the several motiv--ational variables impacting on student performance will be most salient?	LEARNER MOTIVATION
6. Will there be a general trend towards a more versatile style of learning? 7. Will students who exhibit a high level of versatile style early in their training have an academic advantage?	LEARNING STYLE
8. To what extent will students become better learners over three years?	GENERAL DEVELOPMENT

FIGURE 3.1 Research questions and themes guiding the Phase 1 research design.

2. There is a need for both quantitative and qualitative research.

While there are dangers in attempting both quantitative and qualitative methods of data gathering and analysis in a single research design, nevertheless such an attempt was made in the present study. It was argued that the wealth of data generated by a two-pronged approach would more than compensate for any lack

of 'purity' in the research methodologies adopted. Phase 1 in the study, therefore, was to consist of questionnaire data gathered from the complete 1983 intake of Division A students. These data, collected at yearly intervals over a period of three years, were supplemented by interview data from a sample of these same subjects at more frequent intervals. This design is outlined in diagrammatical form in FIGURE 3.2.

The Main Research Sample.

The initial sample consisted of all undergraduate students who entered Hamilton Teachers' College in January 1983. These students were enrolled in three divisions as follows:

Division A - 100 students engaged in a three year course leading to a primary school teaching diploma.
Division B - 6 students engaged in a five year course leading to a double degree and a secondary school teaching diploma.
Division E - 18 students engaged in a two year course leading to a kindergarten teaching diploma.

Divisions B and E students were used initially to increase sample size to allow a factor analysis of the Approaches to Studying Inventory (ASI). However, since the longitudinal design was intended to follow a single intake of students through three years of tertiary study, it was decided that the main research sample should consist of Division A students only.

Most of the subjects in the main research sample (n=100) came straight from secondary school. The exceptions were a few students who had a brief period of employment. Only two students had previous tertiary experience which consisted of a course in typing at a technical institute.

As can be seen from the sex, age, and qualifications breakdown in TABLE 3.1, most of the subjects were female, 17-19 years of age, and all but one had the minimum entry qualification of 6th form certificate.

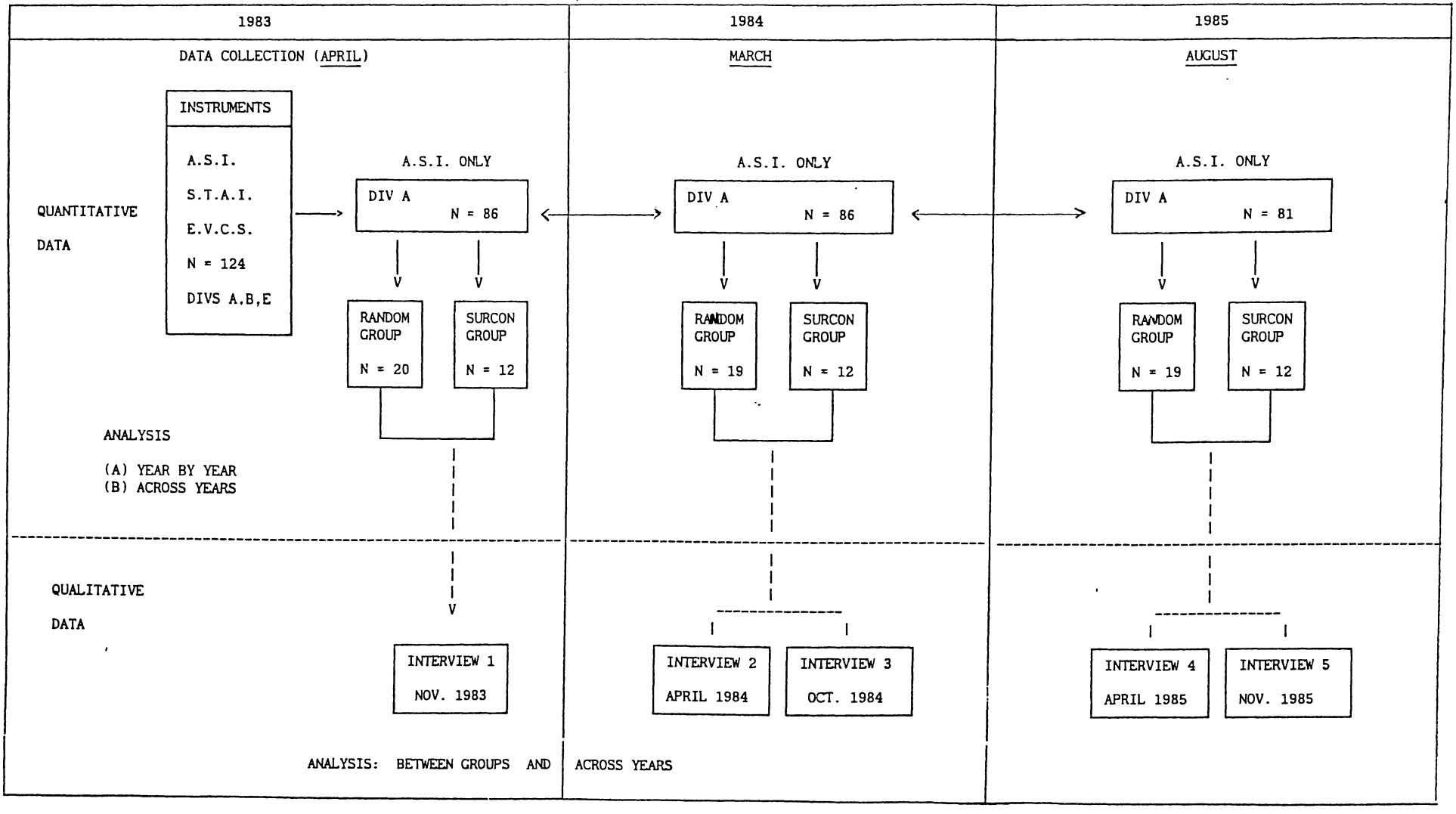

FIGURE 3.2 Diagrammatic representation of the PHASE 1 research design.

TABLE 3.1 The research sample: breakdown for sex, age, entry qualifications, and School Certificate (n=100).

SEX	Male	19
	Female	81
AGE	18 and under	79
	19 - 21	18
	22 - 24	2
	25 and over	1
Maximum qualifications at entry		
	School Certificate	1
	6th Form Certificate	3
	University Entrance	51
	U.E. + 7th Form	30
	Bursary	15
School Certificate marks (English plus best three)		
	195 - 219	17
	220 - 239	19
	240 - 259	22
	260 - 279	20
	280 - 299	12
	300 - 346	10

In the course of the first year, 10 students resigned from the college, and one student indicated that she did not want to participate in the research. Three students resigned early in the second year and, because it was proposed to look at longitudinal development, it was decided to delete these 14 students from the analysis. Thus 86 students out of the original 100 were used in the research sample for Years 1 and 2. A further five students left either at the end of the second year, or during the third year, bringing the final graduating group down to 81 students (in fact, one student who successfully completed the whole 3-year course decided not to graduate, but this was not made known to the researcher until much later, and this student remained in the sample). Reasons for leaving college varied so much that it was not considered worthwhile to treat departing students as a separate group. For example, three students decided to specialize in speech therapy which meant that they had to transfer to another college; three others

transferred to other colleges because their families moved to other centres; a few students who were sound academically made the decision to leave because they felt that they were not suited to teaching; and a few were asked to resign because of very poor performance in either their coursework or teaching practice.

A group of 32 students from the main research sample was selected for interviewing. This involved two groupings:

The Random Group: 20 students who were selected at random from the complete Division A cohort.

The Sur-con Group: 12 students who were selected because they scored highly (+ 1 S.D. or greater) on a particular grouping of the Approaches to Studying Inventory (ASI) sub-scales (see below). If students qualified for this group but had already been selected for the Random group, they remained in the Random group.

Sur-con is an abbreviation for Surface-confused. This grouping of sub-scales was not one of the four major orientations in the official version of the Approaches to Studying Inventory (See TABLE 3.2 below). It was derived from a factor analysis of this inventory by David Watkins (Watkins, 1982a). Watkins' second factor differed slightly from Entwistle and Ramsden's in that it was more complex. Students scoring highly on this factor could be described as having a surface approach to learning, poorly developed study habits and skills, and poor motivation. Such students could easily be described as 'at risk' in an academic setting, and it was felt that this would be an interesting group to follow for a three year period.

It was proposed initially to split the Sur-con group into experimental and control groups, and to provide some form of intervention for the experimental group. However, administrative problems within the teachers college programme prevented the planned intervention on a regular basis and the proposal had to be abandoned.

Data Collection

In addition to all students in the research sample responding to a series of questionnaire instruments, as indicated above a sub-sample (n=32) was interviewed at five points throughout the three years of the study. The interview protocols can be found in APPENDIX B.1, while the guidelines adopted for interviewing are discussed in the next section on research procedures. The present section describes the questionnaire instruments that were employed in the data collection process for the Phase 1 design.

Instruments:

Three questionnaires were employed in the data collection process for Phase 1:

(1) The Approaches to Studying Inventory or ASI (Ramsden and Entwistle, 1981; Entwistle and Ramsden, 1983).

(2) The State-Trait Anxiety Inventory or STAI (Spielberger et al, 1968).

(3) The Expressed Vocational Commitment Scale or EVCS (Ramsay, 1978).

All three questionnaires were administered to all students at the beginning of Phase 1 (April 1983). The ASI was subsequently administered to the main research sample in March 1984, and in August 1985. The S-subscale of the EVCS was given at the conclusion of each interview i.e. a further five times (See the research design in FIGURE 3.1).

1. THE APPROACHES TO STUDYING INVENTORY: This is a 64 item inventory which yields 16 sub-scales, grouped into four main study orientations. The inventory was developed after considerable pilot research in the United Kingdom, and attempted

to incorporate the theoretical positions of Parlett (1970), Entwistle (1975), Biggs (1976), Marton (1976), Pask (1976a, 1976b), Entwistle and Wilson (1977), Entwistle et al. (1979) and Ramsden (1979).

Repeated factor analyses of this inventory at various stages during its development by Entwistle and his colleagues, and later by Watkins (1982a), clearly indicated the existence of two principal orientations to studying, the meaning and reproducing orientations. A third factor, however, provided evidence for an achieving orientation similar to that reported by Biggs (1976). The fourth orientation did not derive from factor analysis, but was an attempt to incorporate the ideas of George Pask with respect to learning styles. This orientation is referred to as styles and pathologies of learning. The various subscales and orientations are outlined in TABLE 3.2, and the complete inventory is presented in APPENDIX A.1.

TABLE 3.2. Sub-scales and orientations of the Approaches to Studying Inventory (Entwistle and Ramsden, 1983).

Orientation	Sub-scales	No.items	Cronbach α
Meaning	Deep-approach (DA)	4	.56 (.31)
	Relating ideas (RI)	4	.47 (.25)
	Use of evidence (UE)	4	.38 (.21)
	Intrinsic motivation (IM)	4	.72 (.61)
Reproducing	Surface approach (SA)	6	.49 (.38)
	Syllabus Bound (SB)	3	.51 (.40)
	Fear of failure (FF)	3	.45 (.42)
	Extrinsic motivation (EM)	4	.78 (.38
Achieving	Disorganized approach (DS)	4(-ve)	.71 (.65)
	Strategic approach (ST)	4	.32 (.26)
	Negative attitudes (NA)	4(-ve	.60 (.43)
	Achievement motivation (AM)	4	.58 (.41)
Styles and pathologies of learning	Comprehension learning (CL)	4	.65 (.48)
	Globetrotting (GLT)	4	.36 (.56)
	Operation learning (OL)	4	.49 (.38)
	Improvidence (IP)	4	.42 (.31)

Co-efficients of internal consistency (Cronbach alphas) for each of the sub-scales are reported by the authors of the ASI and can be found in the second to last column of TABLE 3.2. It was

of concern to the present researcher that some of these coefficients were rather low, and with regard to these low internal consistencies, Entwistle and Ramsden have commented as follows:

> "...although the levels of internal consistency are rather low in some of the sub-scales, the reliability estimates for three of the four orientations are satisfactory, and there is good reason for the lower reliability in the fourth domain. It is unlikely that Styles and Pathologies can be viewed as a single domain, the sub-scales could well be put together in different ways for different purposes" (Entwistle and Ramsden, 1983, p.43).

Indeed, on the same page as this quotation further groupings of sub-scales are proposed e.g. Holist (CL + GLT); Serialist (OL + IP); Versatile (CL + OL); and Non-academic (DS + NA + (-ve) CL)).

Clearly, the authors were constrained by their theoretical model and the conceptual basis for their sub-scales -- even though empirical data did not give strong support for all of these sub-scales.

Concern about these low reliabilities for the ASI sub-scales prompted the present researcher to submit the ASI data from Phase 1 to reliability analysis using the initial sample of 124 student teachers. Alarmingly, the coefficients thus extracted were even lower than those reported by the authors of the scale (see the final column in TABLE 3.2).

The present researcher's factor analysis of ASI data produced 24 factors with eigen values greater than 1. These factors suggested other possible sub-scales (relatively free from any conceptual framework) which in fact had higher reliability coefficients than those reported by Entwistle and Ramsden for their sub-scales (see TABLE 3.3). A detailed description of this factor analysis and the derived subscales may be found in Chapter Five.

Both the original ASI sub-scales, and these new (factor) sub-scales were used as variables in the research programme. As reported at the beginning of this chapter, the problem of which set of sub-scales was really most useful prompted a second phase to the research design. It also had to be kept in mind that the rather small n for the longitudinal study probably contributed to the uncertainty over sub-scale reliabilities.

TABLE 3.3 Sub-scales derived from factor analysis of the A.S.I. (n=124).

Factor	Title	No. of items	Cronbach α
1.	Disorganized and dilatory	4	.67
2.	Open-ended and questioning learning strategy	7	.60
3.	Careful and logical	7	.63
4.	Disgruntled	4	.61
5.	Enthusiasm for study	2	.65
6.	Safety-first learning strategy	4	.60
7.	Need for success	4	.55
8.	Superficial approach	6	.59
9.	Lack of confidence	2	.48
10.	Thoroughness in study	4	.57
11.	Initial-exploratory	3	.54
12.	Vocational impetus	2	.50

Six members of staff from the Education Department of Hamilton Teachers College were individually shown the items making up these new (factor) sub-scales, and were asked to say what they thought each sub-scale was measuring. This was done because the researcher felt constrained by the original ASI instrument's terminology and conceptions. There was strong consensus among the six staff members as to what they thought was being measured and they also reached agreement as to titles for each of the twelve factors outlined in TABLE 3.3 (the items which contribute to each of these sub-scales are included in APPENDIX C.1).

Second order factoring of the ASI sub-scales in this study gave relatively low loadings on the motivational components of the Meaning and Reproducing orientations (Intrinsic and Extrinsic

motivation respectively), and relatively high loadings on Comprehension learning and Improvidence. Thus the Meaning orientation as used in this study, was the sum of the following sub-scales: DA, RI, UE, CL. The Reproducing orientation consisted of SA, SB, FF, and IP. (Indeed Entwistle and Ramsden also report these alternative groupings of sub-scales for these orientations (Entwistle and Ramsden, 1983, p.53). In fact both versions of these orientations were used in the various analyses for the present research, but in the end it was felt that there was an advantage in terms of the structuring of the reporting to separate the motivational components of these orientations as much as possible, and because this was also in line with the factor analysis described above, the adoption of the alternative groupings was justified.

2. THE EXPRESSED VOCATIONAL COMMITMENT SCALE: This scale attempts to measure commitment to a vocation by considering five dimensions as follows:

'O' The ordinal dimension. This takes into account whether the vocation is the person's first, second, third ... choice of career.

'T' The time dimension. Taking into account how long the person has held the desire for this career.

'M' The motivation dimension. This considers the reasons a person has for entering the chosen career (travel, money, altruism etc.).

'C' The career dimension. This considers the career plans an individual has.

'S' The self-estimation of vocational commitment. The person expresses depth of commitment on a Likert-type scale.

A total commitment score is obtained by summing the scores on the five dimensions. Peter Ramsay, the author of this scale, suggested to the writer (personal interview, 1983) that he felt that the final or 'S' dimension was probably the most valid because commitment tended to vary from time to time. For this reason, and also because it is relatively non-threatening and is easy to administer, this 'S' scale was used in each of the interview situations in the present study (a copy of the EVCS is included in APPENDIX A.2).

3. THE STATE-TRAIT ANXIETY INVENTORY: This scale has two forms. Form X-1 consists of 20 Likert-type items concerned with the immediate state a person feels that she/he is in. The 20 items in Form X-2, on the other hand, ask a person to respond in terms of how she/he feels generally. In the present study Form X-1 was used to obtain a measure of a person's anxiety level. It was felt that that this scale is probably easier to respond to, and could well provide a more reliable measure of an anxiety trait than would be obtained from an attempt to generalize (a copy of this scale is included in APPENDIX A.3).

Procedures:

1. Combining the roles of researcher and teacher.

Obvious problems arise when a researcher is also engaged in teaching the subjects of his/her research. For example, students might respond in ways which they think might place them in a favourable light, and/or the researcher might also find it difficult to maintain objectivity. Advantages also exist, however. For instance, the researcher has ready access to the subjects, and can usually rely on a high response rate for the various research instruments.

In some studies subjects have been encouraged to participate in research by receiving some grade credits or payment. In the present research, however, no such extrinsic motivators were necessary, and a high level of cooperation from the student body was enjoyed. The interview sample provided a good gauge of student attitude. Most were very interested in the research and asked to be informed of the results. Several subjects reported spontaneously that they enjoyed being interviewed frequently by a staff member who appeared interested in their activities. Indeed, the researcher was surprised by the honesty with which students discussed their study routines, motivation, and general life as a student. Only one student proved reluctant to be interviewed, and after two sessions did not keep further appointments. One problem encountered was having to carefully avoid falling into a counselling role. Complaints against staff, as well as genuine calls for help, had to be gently passed on to someone else.

2. Questionnaire administration.

(a) The Anxiety Scale and the Approaches to Studying Inventory. Throughout the year, each intake of students at Hamilton Teachers College meets en masse to receive briefing for school practice and other administrative matters. This afforded an ideal opportunity for whole group administration of the questionnaires used in the study. At one such meeting in April 1983, the researcher was introduced to the group by the Intake Co-ordinator as someone interested in learning, and who would like to have the students' cooperation in the matter of completing some questionnaires related to this theme. The anxiety inventory (STAI) was then given out and instructions given fairly tersely. The aim was to maintain a moderately stressful, test-like situation so that anxiety could be experienced and its level expressed.

When the anxiety scale was completed the researcher thanked the students for completing the first questionnaire, and then

explained the purposes of the present study and how the students could assist. It was pointed out, for example, that as student teachers they would have to gain an understanding of how children learn at various ages so that appropriate teaching methods might be applied; that at the tertiary level, however, very little is known about how students learn, and teaching methods might not always be appropriate. Students were then invited to be subjects for the research, and it was explained that such participation was entirely voluntary. Anyone not wanting to participate could simply return blank test forms.

The ASI questionnaire was then introduced as an instrument which would ask questions about the students' study routines and how they went about learning. It was stressed that this was not an attempt to sort out the 'goodies' and 'baddies' for the benefit of staff! This point was explained thus:

> "...indeed we all know people who do remarkably well with apparently very little swot, and others who work very hard for only moderate or very little success. It is what you actually do when learning and studying that appears to be important, but as was mentioned earlier, we know very little about this. The information you will provide in this questionnaire will be very helpful in giving us some ideas about student learning. The results from this study could also help the staff of the college be more effective in their teaching."
> (extract from notes prepared for the first administration of the A.S.I.)

It was also stressed that confidentiality would be respected absolutely. The system for maintaining confidentiality was explained: a code number would be assigned to each student; the questionnaire data from every form would be transferred to special data sheets for the data processors to work from, and these would only contain code numbers and not names; finally, once the data was on punch cards, the questionnaire forms would be destroyed. In spite of such assurances one student handed in a blank form with a note saying that she did not want to participate, and two others gave fictitious names. The wish of the former was of course respected, but the latter were traced

and it was explained to them that the fictitious names did not matter so long as they used the same names each time. In point of fact they used their own names in subsequent administrations of the ASI. There was no time limit imposed for the ASI, the subjects simply being instructed to respond to each item fairly quickly and spontaneously. All subjects had completed the questionnaire within 30 minutes.

Conditions for the first administration of the STAI and ASI were not particularly good. It was at the end of a very hot day in a lecture theatre with poor ventilation. Students appeared tired and listless and so a decision was made to postpone the administration of the third questionnaire. Consequently, permission was obtained for the EVCS to be administered during T-group meetings later in the week (T-groups are small groups of about 20 students placed in the care of a staff member who is their 'Adviser'. As intact groups they frequently form the basis for teaching units in various teachers college courses).

(b) The Expressed Vocational Commitment Scale (EVCS). In introducing the EVCS to the Year 1 sample of students, the concept of 'commitment to teaching' was explained. It was pointed out that it would be very unlikely that all students entering a teachers college would be absolutely certain that teaching was the career for them: some would enter teaching because they had missed out on some other career choice, and others perhaps because of parental pressure; yet again, some students would be 'trying teaching out' rather tentatively. Commitment, then, could be expected to vary widely from person to person, and even within a person from time to time. There could be times, especially after some unfortunate experience in a school, or when under stress with assignments or examinations, that students might seriously question whether they were in the right place. At other times, after some successful experience with children or very positive comments on an assignment, they might well feel elated and impatient to have full responsibility

for their own class of children. The important thing from the point of view of the researcher was that, whatever student teachers' felt level of commitment, it would almost certainly affect their approach to studying and learning.

No time limit was imposed for the EVCS and it was usually completed in about 15 minutes. All students were tested within a three-day period. The small T-group situation in which the EVCS was administered allowed for some discussion about the research in general. It became evident that a few students still had misgivings about the confidentiality factor in the research, as well as the manner in which the results would be used. A few were somewhat sceptical that the questionnaires could be of any value because students would undoubtedly change over three years. The longitudinal plan was thus explained again, and emphasis given to the fact that questionnaire data would be supplemented by data from an interview sample. These discussions probably had a lot to do with the high level of co-operation received from the students throughout the period of the research.

All subsequent administrations of the ASI (early in the second year and near the end of the third year) were in these T-group situations and, each time was completed by all groups within a three day period. On each occasion students were reminded about the purposes of the research, and were reassured about the confidentiality factor.

3. Interview procedures.

Students who had been drawn for the interview sample (the Random and Sur-con groups - see p.77) were first of all asked whether they would agree to be interview subjects. It was explained that they would be committed to two or three interviews each year, and that these could be from 20 - 30 minutes in duration. Interviews would be audiotaped, but no names used, each tape being identified by the code number of the subject. Almost all students were enthusiastic about being subjects in the

interview group. One who was less than enthusiastic dropped out after two interviews and was not replaced. Another subject lost through attrition (leaving college early in the second year) was replaced because at that stage only one interview had taken place. All interviews were held in the privacy of the researcher's study.

Tape recordings were transcribed. Because of the labour intensity of transcribing thirty two 20-30 minute interviews, at times transcribing and interviewing over-lapped i.e. an interview would be conducted before the previous one was transcribed. For this reason it was not possible to give students a personal copy of each transcript for comment or correction, a procedure usually recommended for interview research.

The schedule for the interviews was as follows:

1. Nov. 1983 - at the end of Year 1 and just prior to the Year 1 examinations.
2. April 1984 - early in Year 2 and prior to the first major teaching practice experience in schools.
3. Oct. 1984 - at the end of the second year and subsequent to teaching practice in schools.
4. April 1985 - early in Year 3.
5. Nov. 1985 - subsequent to the Year 3 teaching practice experience in schools and final examinations.

Protocols for the interviews are included in APPENDIX B.1. It should be noted that some questions were common to every interview, while some were specific to the particular time or circumstance of an interview.

Questions common to every interview related to factors such as changes in accommodation, health, personal relationships,

part-time employment and financial situation. At every interview, also, students were asked if their approach to studying had changed, and if so in what way(s). They were asked to describe how they were going about a current assignment, and at the conclusion of each interview were asked also to rate their commitment to teaching on the S sub-scale of the EVCS, and to give a reason for this rating.

Questions specific to only one interview might relate to a school experience student teachers were just anticipating or had just completed, or examinations which were imminent or just finished. At the first interview, students were asked whether they had received any study skills training at school. At the time of Interview 4, students were preparing for a statistics test, and they were asked to explain standard deviation in their own words (this, it was hypothesized, would certainly discriminate surface from deep learners!). In the final interview they reviewed their feelings about the whole teachers college programme.

At the beginning of each interview, some time was taken to establish a relaxed atmosphere. Usually a few minutes of small-talk would suffice. The interviewer and interviewee were seated on easy chairs with a small table between them on which the microphone was placed. At the end of the formal interview the student teachers were specifically asked if they had any questions, even though they were free to question the interviewer at any time during the interview.

Data Analysis

(A) Quantitative Analyses

All data derived from student teacher responses to questionnaires were treated initially on a year by year basis, and examined subsequently across years for the presence or absence of any developmental trends.

Year 1 - Data File and Treatment: In addition to data arising from responses to the ASI, STAI and EVSC questionnaires, each student's Year 1 Data File contained a code number for that student, followed by personal details such as sex, age, entry qualifications, other qualifications, school certificate results, and the Selected Studies courses undertaken (as distinct from Professional Studies).

Early in Year 2, two measures of academic attainment for Year 1 became available and were added to the Year 1 Data File. These measures were:

(i) Bursary. Students could be awarded an A or B Bursary, if in the previous year they had met certain criteria related to their academic performance. The criteria for an A Bursary consisted of B or better grades in each of the six core courses examined, and with no failures in any course. To achieve a B Bursary, students had to have B or better grades in at least three of the six core courses examined, and again they must not have failed in any subject. Ten per cent of the student intake received A Bursaries, and 38 per cent received B Bursaries.

(ii) Academic scores. A problem with the use of Bursary categories as indices of achievement was that four of the six core courses were electives which covered a considerable range of difficulty level. They could be straight academic subjects taken at university, or more practical curriculum type subjects such as Art or Physical Education. The only courses in the 'core' which were common to all students were two education courses, Human Development and Issues in Education, both of which qualified for university credit. Grades from these two subjects were combined to form an 'academic' score.

The data in the Year 1 Data File (and in all subsequent data files) were submitted to computer analysis using the SPSSx programme (Nie et al., 1983). The particular analyses performed on the Year 1 data are listed below:

1. Factor analysis of the ASI (n=124). This consisted of principal factor analyses followed by rotation to oblique simple structures, and a second order factor analysis of the sub-scales.

2. General statistics for all variables (frequency, range, mean, standard deviation).

3. Pearson product-moment correlations of all variables with all other variables.

4. Kolmogorov-Smirnov (non-parametric) test: Used to check whether the Random group really was typical of the whole population.

5. ANOVAS were used to test for significant differences between the Random and Surface-confused groups with respect to the dependent variables. Significant F-ratios were followed by *t*-tests.

6. Similarly, MANOVAS were used to examine the relationship between the ASI scales and Graduation categories (Distinction, Commendation and Ordinary grades) and trends on the scales from year to year. Again, significant F-ratios were followed up by multiple t-tests using the Scheffé procedure to test for significant differences between groups.

7. Reliability co-efficients for the internal consistencies of the A.S.I. sub-scales and the Factor scales were calculated.

Year 2 - Data File and treatment. The Year 2 Data File contained the personal data for each subject, the ASI (Year 2) data, and measures of academic achievement similar to those used in Year 1. In addition, the grades for two essays were included. These essays were designed to discriminate between deep and surface approaches by requiring students to adopt different styles of writing. For one essay, a formal academic style was required with emphasis on acknowledging sources, referencing, and

foot-noting. The second essay asked the student to explain a theoretical issue "as if to a friend who knows little about the subject". It was reasoned that it would be difficult to be successful with the latter utilizing a surface approach.

The essay topics were as follows:

Topic 1. (formal)

Write an essay of about 1200 words on one of the following topics:

Success and failure in school learning: the role of the learner's concept of self.

Success and failure in school learning: the role of the learner's motivation.

Topic 2. (informal)

You are a teacher at Sunnyvale school and the Principal has asked you to give a short talk to parents on some of the new approaches to teaching and learning used in the primary schools today.

Choose one of the approaches that you have studied during Term 3 and write the script for a short (20-30 minutes) talk in which you describe the main features of the approach.

In preparing your script, it will be important to remember that parents tend to react badly to educational jargon. Write your statement in straightforward language that parents will easily understand.

General statistics, correlations, Anovas, t-tests, and reliability co-efficients were calculated as for Year 1.

Year 3 - Data File and treatment. As for previous years, this file contained the A.S.I. scores, and a measure of academic attainment. In addition, the final grades for each student were included. These grades took into account performance over the whole three year period, and they consisted of three divisions: an academic grade; a teaching practice grade; and a combined total grade. On the basis of these grades, the teachers college calculated graduation categories. Thus the top ten percent of student teachers would graduate with distinction, the next

20 percent with commendation, and the remainder as ordinary graduands (this system was discontinued in 1987).

General statistics, correlations, and reliability coefficients were calculated as for previous years. In addition, regression analyses from Years 1 and 2 were run through to final grades to find which variables, if any, were predictors of success at college.

Year by Year Analysis. The design called for one and two-factor MANOVAS with repeated measures. Where significant F-ratios resulted from the Manova calculations, t-tests for related samples were used to check the significance of differences between sub-scale means from year to year.

These tests were supplemented by Chi-square analyses which provided further information (means might show no significant difference, but this could mask the fact that nevertheless considerable changes in student scores did take place, the differences simply cancelling out). Sub-scale scores were first converted to standard scores to allow for comparisons to be made from different distributions. These standard scores were then recoded to form five equal-interval groups. From the Chi-square analysis it could then be seen how many students remained in the same group, moved up, or moved down groups from one year to another.

For the year by year comparisons of the quantitative measures relating to the interview group, t-tests were most appropriate given the relatively small n's.

(B) Qualitative Analyses

Interviews. For each interview, student responses to every question were categorized. A matrix was then formed which allowed the patterns and the variety of answers to be readily seen. Frequency counts could be made of responses in each category and, in some cases, chi-square procedures were

appropriate to test for differences between groups with respect to certain questions.

When all the interviews were completed, the questions were arranged according to topics. These topics were broad, and corresponded to the topics under which the main research questions were grouped. TABLE 3.4 lists the topics, as well as the questions from each interview which related to that topic. This procedure assisted the longitudinal analysis where, for example, the responses of a single student to questions relating to study strategies could easily be traced over the three year period (see Case Studies below). A full summary of the first and final interviews may be found in APPENDICES B.2 and B.3. For interviews 2, 3 and 4, the main trends and important points only are reported.

TABLE 3.4 Questions from each interview related to specific topics.

TOPIC	INTERVIEW				
	I	II	III	IV	V
STUDY STRATEGIES AND APPROACHES TO LEARNING					
*past	1a,b,c				
*present	5a,b,c	3a,b	4a,b	6a	2,4,6
*changes in	3			6b	3,9
MOTIVATION					
*anxiety	2,11		2a	7	11
*n.ach	6b,7,8	6b			
*goals	6a	6a	5	8	7,8
*commitment	10	7	6	9	13,14
*feedback		4	4c		
*interest vs. need	1d,4			2a,b,3	6
*other	9	2,5			12
EXTERNAL FACTORS					
*general		1	1	1	1
*workload			4a	5	
*teaching style					5
TEACHING PRACTICE			3a,b,c,d		14
EVALUATION			2b		10
PERSONALITY/ATTITUDES		2			

Case Studies. To shed further light on what happens to student development over three years of tertiary study, a case study approach was adopted with six selected students. Their responses to interview questions and questionnaires, as well as general information regarding their college performance, was collated to provide pen-portraits of their general development. Selection of students for the case studies was made with respect to the following criteria:

* They must have participated in all five interviews.

* There had to be three students from the Random Group and three from the Surface-confused Group.

* There had to be at least one student from each graduation category.

* There had to be at least two students who had high scores in the Meaning orientation of the ASI, and two with high scores in the Versatility orientation.

The student who completed the three year course, but who decided not to graduate, was also included as an interesting subject to study.

CHAPTER FOUR

RESEARCH METHOD: THE PHASE 2 RESEARCH DESIGN

In the course of Phase 1 of the study, certain factors emerged which suggested the need for a second phase to the research programme. These factors may be summarized as follows:

1. Staff perceptions of student change. The initial study looked at student development and change through the eyes of the students themselves. There seemed to be some advantages in considering how members of the teaching faculty perceive student development, and what they claim faculty actually do in order to facilitate positive development in their clients.

2. Changes in the teachers college programme subsequent to Phase 1. During 1982 and 1983, staff of the teachers college (along with some outside agencies) were engaged in an extensive review of the College Programme. A new programme was introduced to first year students in 1984, and to each intake thereafter, until by 1986 all students were involved with the new programme. This programme was designed to provide better learning experiences for students by providing them with more elements of choice in their course of study, and making the links between theory and practice stronger and more tangible.

Because the subjects in Phase 1 of the study were the last students to complete the old programme, it was felt that a second phase would provide an opportunity to compare the old and new programmes in terms of the effects they might have on student learning.

3. Approaches to Studying Inventory (ASI) sub-scale reliability. A reliability check on the sub-scales of the ASI revealed rather low reliability coefficients. Alternative grouping of items suggested by factor analysis in the present study (see Chapter Five) yielded scales with considerably higher reliabilities. Reliability, however, depends to a considerable degree on the

size of the sample, and it was speculated that the much larger sample available in a cross-sectional approach might shed some light on the problem as to which scales are really the most useful.

4. Validation of findings from a longitudinal study by checking with data from a cross-sectional approach in the same setting. The longitudinal research in Phase 1, while providing very interesting insights into student development, was dependent on a rather small sample (only 81 students completed the three year course). A cross-sectional study with similar students in the same educational setting might well provide stronger validity for these findings.

The factors outlined above provided the researcher with a strong rationale for developing the research further. First the research questions guiding the Phase 1 research design could now be examined with regard to larger cross-sectional samples of student teachers at the Year 1, 2 and 3 levels. Secondly, however, a further set of research questions had become pertinent. These new research questions are presented on the following page.

The research questions in FIGURE 4.1 below determined that there be three sections in the Phase 2 research design. The first section, dealing principally with qualitative data, was concerned with the input of staff ideas with respect to student teachers' approaches to studying and their general development. The second section consisted of a cross-sectional study involving use of the Approaches to Studying Inventory (ASI) with the whole body of Division A students at the college during 1987. The third section compared the data from sections 1 and 2, in an attempt to analyze student and staff perceptions of student development and approaches to learning. The description of the Phase 2 design which follows treats each section in turn. A diagrammatic representation of the Phase 2 research design is depicted in FIGURE 4.2.

RESEARCH QUESTIONS
1. From the perspective of the teaching staff: 1.1 What are the characteristics of successful and unsuccessful students? 1.2 What qualities are students expected to develop as a result of exposure to their courses? 1.3 To what extent are these expectations realized? 1.4 What do individual staff members do in order to bring about the developments they would like to see in students?
2. Will the new college programme effect a different pattern of student development from that seen in the Phase 1 results for the old college programme?
3. Which set of ASI sub-scales, Those generated by Entwistle and Ramsden (1983), or those generated from factor analysis of the Phase 1 data in the present study will prove to have the stronger reliability coefficients with the larger cross-sectional sample used in Phase 2?
4. Will the cross-sectional data from Phase 2 of the present study confirm the patterns of student development found in Phase 1?

FIGURE 4.1 Research questions directing Phase 2.

The Section 1 Design

The Staff Sample: Details of the staff interview sample are shown in TABLE 4.1 below. Several criteria were applied when selecting staff to be included in this interview sample of 13:

1. Relative teaching experience: the staff member had to be currently engaged in teaching at least two of the Division A student intakes, and to have had recent experience with the remaining intake. For example, if a

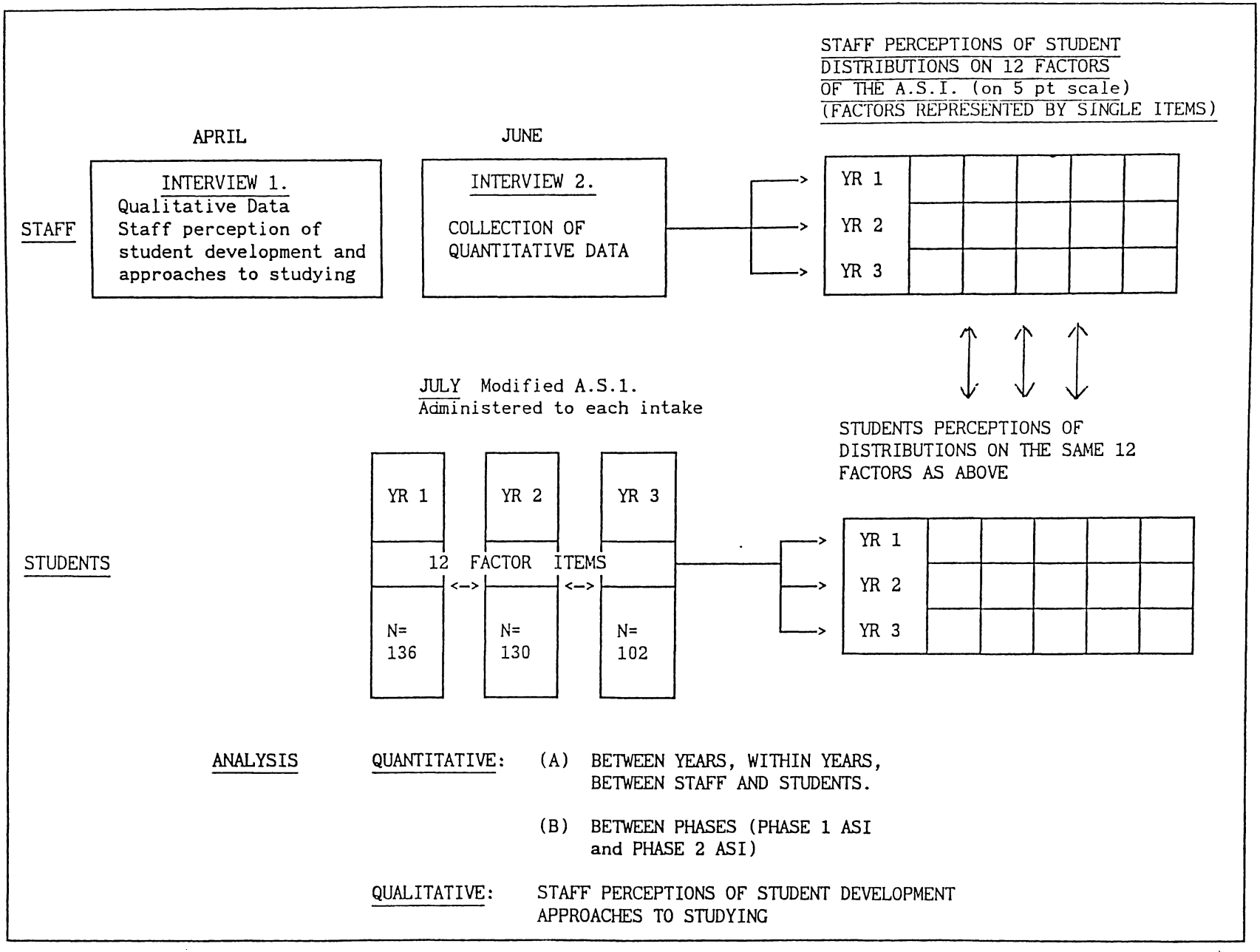

FIGURE 4.2 Diagrammatic representation of the PHASE 2 research design.

lecturer were teaching currently in the Year 1 and Year 2 programmes, she/he would meet the criterion if in the previous year she/he had worked with third year students.

2. Proportional representation of teaching departments: it was desirable that as many subject areas as possible be represented, and that representation be proportional to the size of the various departments.

3. A mix of seniority level: it was desirable that a reasonable mix of junior and senior staff be obtained.

4. Balance of sexes: as far as possible with a predominantly male staff, there should be adequate female representation.

TABLE 4.1 Department, sex, and seniority levels of the staff interview sample.

Department	Male	Female	Junior	Senior
Art		1		1
Education	3	1	2	2
English	1	1		2
Maths/Science	2		1	1
Music	1			1
Phys. Educ.		1	1	
Social Studies	2		1	1
TOTAL	9	4	5	8

Data collection: Each staff member was interviewed twice by the researcher, and all the interviews were completed within a two week period.

INTERVIEW 1. The first interview was concerned mainly with obtaining staff perceptions of students' study skills, attitudes, motivation and development. The protocol for this interview is outlined below.

INTRODUCTION: *I am interested in your views as to how students develop or change as a result of their experiences in college. I realize that it might be difficult to generalize, but please try.*

Q.1. What courses do you teach this year?

Q.2. What qualities are typically present in a student who is successful in your courses?

Q.3. What qualities are typically present in a student who is not successful in your courses?

Q.4. Thinking now about students when they first come into college, how well equipped do you think they are to study effectively in your courses?
(Prompt - skills such as essay writing, reading, research; attitudes such as industriousness, independence, positiveness.)

Q.5. Do you believe that students' approaches to studying change significantly over three years at college?
Follow up by asking in what ways, or why not?)

Q.6. Would you care to tell me what you have actually done, or what you would like to do to help students develop effective study skills over three years?
(Take one question at a time)

Q.7. I would like you to describe what you think are the qualities of the ideal student.

A transcript of the interview was returned to each interviewee within one week of the interview so that an accuracy

check could be made, and further comments could be added if an interviewee so wished.

Student and staff perceptions. The factor sub-scales of the ASI described earlier formed the basis for a comparison of student and staff perceptions of student approaches to studying. Several staff members (not included in the interview sample) had already participated by describing what they thought each factor measured (see p.81). From these descriptions, the researcher constructed one item designed to catch the 'essence' of each factor. While it might have been simpler to have selected the ASI item which contributed most to the variance of each factor to represent that factor, this was not really acceptable because several of the factors did not represent single dimensions. Thus, the specially constructed items were discussed with three members of the University of Waikato Education Faculty, and amended if necessary until agreement was reached that each item, so far as was possible, captured the meaning of that factor. These new items were inserted into the ASI which students would be responding to in the next section of Phase 2 of the research. An example of a factor sub-scale with its component items, and the single item constructed to represent that factor is shown in TABLE 4.2. The complete Factor Scales are included in APPENDIX C.1.

INTERVIEW 2. The second interview was really an introduction to a questionnaire constructed on the basis of the twelve new items referred to above. This Staff Perceptions of Student Development Questionnaire (SPSDQ) was a fairly complex questionnaire which required careful explanation (see APPENDIX A.4). Although a full explanation with a practice example was included in the instructions, the presence of the researcher to answer questions and clear up misunderstandings was desirable. Briefly, it was explained that twelve factors had been isolated

TABLE 4.2 Factor sub-scale 4 with component items from the Approaches to Studying Inventory, and the single item constructed to represent factor 4. The factor loadings for each item are included.

FACTOR 4

TITLE DISGRUNTLED
(The student has doubts as to vocational choice and has a passive negative approach to learning.)

Items:

16. Lecturers seem to delight in making the simple truth unnecessarily complicated. (.43)

23. Often I find myself wondering whether the work I am doing here is really worthwhile. (.75)

24. I generally put a lot of effort into trying to understand things which initially seem difficult. (-.33)

63. When I look back, I sometimes wonder why I ever decided to come here. (.72)

(Scale reliability: Year 1. .65; year 2. .60; Year 3. .48)

REPRESENTATIVE ITEM: Some of the subjects I have to study make me wonder if I really should be in teacher training.

from Phase 1 of the research, and the respondent was required to give his / her opinion as to how students would rate on each factor for each year of the college programme. The procedure required each subject (a) to consider a group of 20 'typical' first year students (the number 20 was chosen because it represented the normal size of a T-group, and would be easy therefore to visualize, and the figures would be manageable), and

(b) to distribute the 20 students on a five-point scale from being very low to very high on that factor. Once the practice example and the first question were successfully attempted, the subject completed the rest of the questionnaire unaided. TABLE 4.3 gives an example of how one subject responded to question one for first year students.

TABLE 4.3 Example of a response by one staff member to one item of the Staff Perceptions of Student Development Questionnaire.

FACTOR 4 DISGRUNTLED

Item	(V.low)				(V.high)
Some of the subjects I have to study make me wonder if I really should be in Teacher Training	6	8	1	2	3

It can be seen that, in the opinion of this lecturer, about 25 per-cent of first year students are disgruntled or discontented, particularly with respect to the nature of their course of study.

Data Analysis.

INTERVIEW 1. The interviews were transcribed and copies of the transcripts were checked by the subjects. Responses to each question were categorized, firstly into broad categories, and then into sub-categories. Extracts in the form of phrases or sentences from the transcripts were included under each sub-category, along with the code number identifying the respondent in each case.

The procedure is best illustrated by an example. The first question asked for the characteristics of successful students, and provided answers which fell into four broad categories which

described Academic, Attitudinal, Motivational and Personality characteristics respectively. Each of these broad categories could be divided into sub-categories. For example, the academic characteristics of successful students had seven sub-categories which are listed below. Four staff members made comments to the effect that they thought successful students had a questioning, thinking approach to learning. This formed sub-category 1. The various extracts from the transcripts are included to provide an example of the whole procedure. The figure in parenthesis following each extract is the code number identifying the staff member.

(A) ACADEMIC QUALITIES

1. A questioning, thinking approach to learning
"...a thinking student." (1)
"...a questioning student." (4)
"...able to discriminate fact from fiction."(13)
"A student who will question and debate, rather than accept what is said." (11)

2. Applies theory to Practice.
(six extracts)

3. Has a flexible, open approach.
(three extracts)

4. Has high level thinking skills.
(three extracts)

5. Competence.
(five extracts)

6. Is 'Syllabus free'.
(one extract)

7. Is objective.
(one extract)

INTERVIEW 2. The responses of the 13 subjects to each of the questions were averaged for each year. To illustrate, question one averages for each year are shown in TABLE 4.4. From inspection of these sample data, it can be seen that staff on the whole do not see any dramatic improvement in students' abilities to organize themselves and get down to work over the three year period.

TABLE 4.4 Staff responses to item 1 of the Staff Perceptions of Student Development Questionnaire averaged for 13 subjects. The figures represent the percentage of students in each category of a five-point scale for Years 1, 2 and 3.

FACTOR 1. Ineffective organization and use of study time						
		(V.low)				(V.high
Item: I have difficulty in getting myself organized to get down to work.	Yr 1	10.0	23.8	29.6	22.3	13.8
	Yr 2	9.4	17.2	35.0	23.3	15.0
	Yr 3	12.3	25.9	30.9	18.6	12.3

A chi-square analysis was applied to the data for each factor to determine whether trends in the distributions from year to year were significant.

The Section 2 Design

The Student Sample. The cross-sectional analysis of student responses to the ASI instrument included all the Division A students attending Hamilton Teachers College in 1987. The breakdown of each student year by sex and age variables is set out in TABLE 4.5. The proportion of males to females was similar to that of the population in the longitudinal study (Phase 1 Research Design). The ages of the students in the cross-sectional population, however, differed from those in the

TABLE 4.5 Frequencies for sex and age for each intake of Division A students at Hamilton Teachers College in 1987.

		SEX		AGE GROUP					
Year	(n)	M	F	<18	18	19	20	21-4	25+
Year 1	136	22	114	25	66	13	9	13	10
Year 2	130	21	109	0	28	52	32	9	9
Year 3	102	14	88	0	3	12	36	33	18

longitudinal study. The first year group for the 1987 sample had a greater number of older students, and the same characteristic is noted when the longitudinal group is compared with the 1987 second and third year samples respectively. It appears that in recent years, there has been a trend to accept students in the older age brackets. TABLE 4.6 shows the percentages of students in two of the over-21 years of age categories. Although the month in which the ASI was administered differed (being April for the 1983 group, and July for the 1987 groups), this would not account for the differences noted in TABLE 4.6.

In hindsight, it would have been better for the researcher to have required the students to enter their ages in years and months at entry to teachers college, rather than have them circle the age category to which they belonged. The latter broad categories were sufficient for Phase 1 of the study, when a second phase was not anticipated. Indeed, the homogeneity with respect to age of the 1983 group meant that it was not worth considering age as a variable in the study. In Phase 2, however, age was obviously a relevant factor to consider. A difficulty arises therefore when one wishes to compare the first, second and third year groups from Phase 1 with the respective groups in Phase 2. How much the differences in the dependent variables of the two phases can be attributed to age differences cannot readily be ascertained.

Ethnicity was not included as a variable in Phase 1 because the non-European sample would have been too small to provide for

TABLE 4.6 Percentage of students in two (older age) categories, for the Phase 1 population (L), and the Phase 2 populations (C).

	YEAR 1		YEAR 2		YEAR 3	
	L	C	L	C	L	C
Median Age	18	18	19	19	20	21
21 not yet 25	2.0	9.6	5.8	6.9	8.6	32.4
25 and over	1.0	7.4	1.2	6.9	1.2	17.6

meaningful differences. For the same reason ethnicity was not a variable in the cross-sectional study in Phase 2. There were, however, more Maori students in the Phase 2 sample than in Phase 1 (14 percent compared with 11 percent).

Data Collection. The modified A.S.I. was administered during the second and third weeks in July, 1987. The year three students had just returned from six weeks of teaching practice, in schools, and the second year students were soon to leave for five weeks of teaching practice. This was the only period, apart from the beginning and end of the year, when all three student intakes were physically present in the college. To have conducted the cross-sectional study at the beginning or end of the year would have meant invalidating the comparisons for either the Year 1 or the Year 3 populations. At the beginning of the year, the Year 3 students could not be compared with the Year 3 population in the longitudinal study, because that group had completed the questionnaire at the end of their three years. To have given the ASI at the end of 1987, would have meant that the Year 1's could not be validly compared. It was thus determined that the best compromise was to conduct the cross-sectional study sometime in the middle of the year.

The way in which the items representing the factor scales of the ASI were constructed has already been described in Section 1

of this chapter. These items were inserted evenly throughout the scale to avoid any placement effect (such as perhaps a weakening of concentration which might affect items at the end of a lengthy questionnaire). The modified ASI therefore consisted of 76 items.

Because of the difficulty in getting a complete intake together at a reasonable time of day, the questionnaire was administered to tutor groups in a classroom situation for Years 1 and 2 students. The Year 3 students had an intake meeting in mid-morning, and the questionnaire was completed by this group at this time.

A procedural variation from Phase 1 of the study was that small group administration of the modified ASI to Year 1 and 2 students was conducted by college lecturers rather than by the researcher who had other teaching commitments. An instruction sheet was prepared (see APPENDIX A.1.3), which included an outline of the purpose of the study, the procedures to ensure confidentiality of the responses, and detailed instructions for administration. This was given to the staff concerned several days beforehand so that they had ample time to familiarize themselves with what was required. Only in one case was there any problem with this procedure: one lecturer misunderstood the confidentiality explanation, and told students that they need not enter their names on the forms if they did not want to. Five students omitted their names as a result of this instruction, but since they entered their personal background details and the addition of further data was not contemplated, this was not serious.

The researcher administered the questionnaire to the complete third year group in a lecture theatre. The same explanation and set of instructions were given to the third year group as were given to the first and second year students. The atmosphere was friendly and there were no problems with student attitude and co-operation.

Data Analysis

The SPSSx programme, (Nie et al., 1983) was again used for computer analysis of the data.

THE DATA FILE

This file contained the subject identification code, personal background details of sex, age, year of study, and selected study courses, as well as the responses to the modified ASI.

THE COMMAND FILE

The command file was constructed so that the 12 factor-items, the ASI sub-scales and the factor sub-scales could all be extracted for analysis.

The following calculations were performed on the data:

1. General statistics: frequencies, means, range and standard deviations for all variables, including each of the 12 items inserted into the ASI.

2. Correlations: Pearson product-moment correlation coefficients were calculated for all variables with all variables. This included correlations between each of the 12 items inserted into the ASI and the factors which they were constructed to represent.

3 Reliability co-efficients for the ASI sub-scales, and for the Factor sub-scales were calculated.

4. MANOVAS were performed for the sub-scales over years, and by age. The age factor was also treated as a covariate in analyses of covariance. The sex factor was also included but the n's for the sexes were so unequal,

that these tests were not really appropriate. T-tests were used following significant F-ratios to check the significance of the differences between particular sets of means. Chi-square analyses on transformed, grouped frequency distributions were performed as for the Phase 1 data.

The Section 3 Design

Comparing student and staff perceptions of student development and attitudes. It was decided that in order to make such a comparison, some common ground would be necessary. Thus, both groups were required to respond to the same set of questions (these being the items which were constructed to represent each of the Factor Scales). A description of how those data were collected and treated is contained in sections 1 and 2 respectively. For the purposes of this section, the comparisons to be made were of the staff and student frequency distributions for each 'factor' item. Usually, a Chi-square analysis or the Kolmogorov-Smirnov test would be appropriate to test whether the differences between the two sets of distributions are significant. In this case, however, these forms of analyses were not appropriate because different procedures were adopted by each group when responding to the items. Instructions for the A.S.I. asked the responder to avoid using the middle category if possible. For the staff questionnaire, however, it was decided not to make this requirement. The result was that staff responses to these items tended to have flat or normal distributions, whereas student responses tend to be bi-polar. Nevertheless directional differences which were dramatic could be noted by inspection of the data (TABLE 4.7 provides an illustration). Treating the data further by, for example, distributing the middle category for the staff equally on either side, could have meant losing some valuable information in some cases. It can be seen from the TABLE 4.7 example however, that if this was done the distributions would be very similar. The

TABLE 4.7 Comparison of staff and student responses to Factor Item 1 for Year 1 students. Frequencies are in percentages (to the nearest whole number).

FACTOR 1 Ineffective organization and use of study time

Item: I have difficulty in getting myself organized to get down to work.	(V.low)				(V.high)
STAFF	10	24	30	22	14
STUDENT	14	31	3	35	17

same conclusion may be reached by noting that students distribute themselves fairly evenly on the high and low sides of the middle category, and that staff distribute themselves in a similar way. It could be concluded therefore, that staff and students do not differ markedly with respect to their perceptions of first-year students' abilities to organize themselves to get down to work.

CHAPTER FIVE

INTRODUCTION TO THE REPORTING OF RESULTS

The reporting of the results in the next few chapters follows the research questions set out in Chapter Three and is summarized in FIGURE 5.1. It should be noted that research questions 1 - 8 in this FIGURE refer to both the Phase 1 and Phase 2 research designs (see the Data Source column at the right). It will be remembered that the Phase 2 research design accommodated four research questions (see p.98). In FIGURE 5.1 research question 9 refers to the first question only of the Phase 2 design. Findings for the remaining research questions in that design are discussed within the framework of the first eight questions in FIGURE 5.1.

This introduction deals with features which have a bearing on all sections of the results. PART 1 discusses the factor analyses of the Approaches to Studying Inventory (ASI). PART 2 deals with the reliability problems associated with this Inventory. PART 3 consists mainly of tables of means and standard deviations for the ASI sub-scales for the longitudinal and cross-sectional phases of the research.

PART 1: Factor Analysis of the Approaches to Studying Inventory.

Factor analysis of the ASI reported in the literature (Watkins, 1982a; Entwistle and Ramsden, 1983;) reports the second-order factoring of the sub-scales which provides the basis for the Meaning, Reproducing, and Achievement orientations. The actual sub-scales themselves, however, were not derived solely from factor analysis. Some sub-scales were constructed in order to conceptually underpin constructs suggested by various researchers in the field e.g. Deep Approach and Surface Approach (Marton, 1975); Serial and Holist approaches, Comprehension and

CHAPTER	THEME	RESEARCH QUESTIONS	DATA SOURCE
5	Introduction to results section.		ASI
6	The learner's intention with respect to study strategies	1. To what extent will there be variability with respect to study strategies? 2. Will there be a general trend with respect to approaches to learning such as an increase in deep-level processing? 3. How are the different approaches to studying related to academic success?	Phase 1. Longitudinal (qualitative and quantitative data) Phase 2. Cross-sectional (qualitative and quantitative data)
7	Learner Motivation	4. What relationship, if any, will there be between learning strategies and student motivation? 5. Which of the several motivational variables impacting on student performance will be most salient?	Phase 1. Longitudinal (qualitative and quantitative data) Phase 2. Cross-sectional (qualitative and quantitative data)
8	Learning Style	6. Will there be a general trend towards a more versatile learning style? 7. Will students who exhibit a high level of versatile style early in their training have an academic advantage?	Phase 1. Longitudinal (Qualitative and quantitative data) Phase 2. Cross-sectional (qualitative and quantitative data)
9	General Development	8 . To what extent will students become better learners over three years? 9. How do faculty perceive student development, and do their perceptions correspond with student perceptions?	Phase 1. Longitudinal (Qualitative and quantitative data) Phase 2. Cross-sectional data -staff interviews)

FIGURE 5.1 Organization of results chapters.

Operation Learning styles and their associated pathologies of Globetrotting and Improvidence (Pask, 1976a); Cue-consciousness and Strategic Approach (Miller and Parlett, 1974; Ramsden, 1979); Intrinsic and Extrinsic Motivation (Biggs, 1978, 1979). Commenting on the final version of the Inventory, Entwistle and Ramsden noted:

> "In deciding the items to be included in the final research version of the inventory, all the previous inventories were reviewed to identify items which had worked well at some stage within one or other of the sub-scales now to be formed. Each sub-scale, with the exception of Surface Approach which had proved the most difficult to define, was limited to maximum of four items to ensure a manageable overall length on the basis of the highest correlations between item and sub-scale total, consistent with retaining the conceptual definition of the sub-scales."
> (Entwistle and Ramsden, 1983, pp.42-43)

The authors then refer to some of the low internal-consistency coefficients (a point already mentioned in Chapter Three). That some of these reliability coefficients are alarmingly low is illustrated by the following data abstracted from The Final Version of the Inventory which is included in the appendices to Understanding Student Learning (Entwistle and Ramsden, 1983, pp.228-233), and is also appended to the present study (See APPENDIX A.1.2).

> Sub-scale: Strategic Approach. (Cronbach α = .32)
> Item-scale correlations (Corrected to remove the contribution of that item to the scale total), are, for the four items 0.16, 0.16, 0.18, and 0.16.

A reliability check of the sub-scales, based on the 1983 data of the present study (n=124), revealed even lower alphas for these sub-scales. For example, the sub-scale Strategic Approach, referred to above had a Cronbach α = .26.

This finding put in doubt the utility of using some of the sub-scales. Differences in subject scores on the same scales from one year to the next could have been due to the low

TABLE 5.1 Factor analysis of the Approaches to Studying inventory. (P.C.F. extraction, varimax rotation). n=124 Factors with internal consistency coefficients greater than 0.5 are presented and only those items with loadings greater than 0.30 are tabled.

FACTOR 1 (.67)		FACTOR 2 (.60)		FACTOR 3 (.63)	
ASI item		ASI item		ASI item	
1	.57	10	.40	11	.35
*12	.34	21	.34	25	.43
14	.68	25	-.30	33	.46
17	.32	29	.32	50	.39
28	.65	31	.37	57	-.30
		40	.65	59	.75
		44	.48	60	.32
FACTOR 4 (.63)		FACTOR 5 (.65)		FACTOR 6 (.61)	
ASI item		ASI item		ASI item	
16	.43	47	.82	9	.32
23	.75	64	.58	27	.67
24	-.33			53	.67
*35	.34			62	.33
63	.72				
FACTOR 7 (.55)		FACTOR 8 (.53)		FACTOR 9 (.54)	
ASI item		ASI item		ASI item	
4	.47	5	-.44	26	.62
15	.45	19	.45	36	.39
31	-.33	24	-.31	41	.60
42	.73	33	-.39		
		46	.62		
		57	.36		
FACTOR 10 (.55)		FACTOR 11 (.54)		FACTOR 12 (.51)	
ASI item		ASI item		ASI item	
12	-.41	34	.78	7	.57
19	-.35	50	.47	*10	.32
52	-.37	52	-.33	22	.73
61	.69				

* indicates items dropped to increase scale reliability

reliability of the sub-scale rather than to any real difference in the student with respect to the construct being measured.

Factor analysis by the present researcher, of the 64 items of the ASI suggested groupings of items that would form alternative sub-scales. The initial analysis produced 24 factors

with eigen-values greater than 1. Each of these factors was submitted to a reliability analysis, and 12 factors which had alphas greater than .5 were used as alternative sub-scales. These factor-scales are summarized in TABLE 5.1. Included in the statistical summary provided by the SPSSx programme for reliability commands, are figures giving the reliability of the sub-scale if any of the component items were deleted from the scale. In three cases (factors 1, 4 and 12) sub-scale reliability was increased by the omission of one item. This item is indicated by an asterisk in TABLE 5.1.

These Factor scales therefore had some empirical validity, but what did they mean conceptually? The methods section (Chapters Three and Four) described how these scales were presented to six lecturers in the Education Department who were asked to indicate what they thought each scale was measuring. By this means, a scale title and an explanatory phrase was given to each scale. A brief example will illustrate the procedure:

FACTOR 6.

Item. I like to be told precisely what to do in essays or other assignments.

Item. I prefer to follow well tried approaches to problems rather than attempt anything too adventurous.

Item. Having to speak in tutorials is quite an ordeal for me.

Item. Tutors seem to want me to be more adventurous in making use of my own ideas.

Staff comments: "techniques to avoid failure"
"a very passive approach to learning"
"non risk-taking approach to learning"
"safety first"
"safety through not taking any risks"
"avoids thinking"

The title adopted: **Safety-first approach to learning.**
(The learner avoids taking risks and prefers to adopt a passive approach to learning.)

APPENDIX C.1 presents a full description of each of the 12 factors. These factors may be summarized as follows:

Factor 1. Disorganized and Dilatory Approach to Learning.

Factor 2. Open ended and Questioning Learning Strategy.

Factor 3. Careful and Logical Approach.

Factor 4. Disgruntled.

Factor 5. Enthusiasm for Study.

Factor 6. Safety-first Learning Strategy.

Factor 7. Need for Success.

Factor 8. Superficial Approach.

Factor 9. Lack of Confidence (in the strategy adopted).

Factor 10. Thoroughness in Study.

Factor 11. Initial Exploratory Approach.

Factor 12. Vocational Impetus.

To see whether these sub-scales formed meaningful groups, a second-order factor analysis was undertaken. Five groups emerged, and the loadings on each sub-scale are shown in TABLE 5.2. A description of each of the second-order factors follows (called 'orientations', to be consistent with Entwistle's term for second-order factors of his sub-scales).

TABLE 5.2 Factor analysis of the Factor sub-scales of the ASI. (P.C.F. extraction, varimax rotation) Only the loadings greater than .30 are tabled.

	FACTOR				
Sub-scale	I	II	III	IV	V
F 1	.50				
F 2			-.40	.42	
F 3		.35		-.73	
F 4	.54				
F 5	-.40				
F 6					.51
F 7			.81		
F 8	.60				
F 9					.57
F 10	-.45				-.37
F 11		.81			
F 12		-.41			

ORIENTATION 1.	Factors	
	F 8	Superficial approach to study
Superficial and	F 4	Disgruntled
Disinterested	F 1	Disorganized and dilatory
	F 10	(Negative) Thoroughness in study
	F 5	(Negative) Enthusiasm for study

The first orientation consisted of a fairly cohesive set of sub-scales and described students who had a superficial and disinterested approach to studying.

ORIENTATION 2	Factors	
Exploratory - logical	F 11	Initial exploratory study strategy
	F 3	Cautious and logical
	F 12	(Negative) Vocational impetus

This grouping described students who explored resources widely in beginning a topic of study, but who then adopted a cautious, logical approach in developing ideas.

ORIENTATION 3	Factors	
N.Ach. Structured	F 7	Need for success
	F 2	(Negative) Open-ended, questioning learning style

This grouping of sub-scales described students who were motivated by a high need to succeed and who preferred a closed, structured learning situation.

ORIENTATION 4	Factors	
Questioning - adventurous	F 3	(Negative) Cautious and logical approach
	F 2	Open-ended, questioning learning style

This grouping described students who had an intuitive adventurous approach, coupled with an open-ended questioning learning style.

ORIENTATION 5	Factors	
Tentative, lacking confidence	F 9	Lack of confidence (in the study strategy adopted)
	F 6	Safety-first, non risk-taking
	F 10	(Negative) Thoroughness in studying

Thus Orientation 5 suggested a lack of confidence in the study strategy being used, leading to a safe, non risk-taking approach, without much commitment.

PART 2 Sub-scale Reliabilities.

It was decided to use both the Entwistle sub-scales and the derived Factor sub-scales for investigating aspects of student learning. The relatively small n available for the factor analysis meant that the results had to be treated tentatively. Indeed, one of the reasons for instigating a second phase to the research was that the larger n available in the cross-sectional study might resolve which set of sub-scales had the greater consistency. In the event, not a great deal was resolved from the cross-sectional results. The Entwistle sub-scales had slightly higher reliabilities and the Factor sub-scales had slightly lower reliabilities respectively, than they had in Phase 1 (sub-scale reliabilities are included in APPENDIX C.4. These results gave support to the decision to continue with both sets of sub-scales. While little confidence could be placed in those sub-scales which yielded low co-efficients of internal consistency in both the longitudinal and cross-sectional phases, interesting information could be gained from those scales which had consistently high reliabilities.

Sub-scales with consistently low reliability co-efficients were:

1. The Entwistle Scales-	Strategic Approach	.19 (Phase 1) .38 (Phase 2)
	Syllabus Bound	.30 (Phase 1) .44 (Phase 2)
	Globe-trotting	.37 (Phase 1) .43 (Phase 2)
2. The Factor Scales-	Lack of Confidence	.33 (Phase 1) .43 (Phase 2)

Subscales with consistently high reliability co-efficients were:

1. The Entwistle Scales:	Disorganized Study	.70 (Phase 1) .70 (Phase 2)
	Intrinsic Motivation	.55 (Phase 1) .60 (Phase 2)
	Comprehension Learning	.55 (Phase 1) .57 (Phase 2)
2. The Factor Scales:	Disorganized and Dilatory	.71 (Phase 1) .74 (Phase 2)
	Open-Approach	.56 (Phase 1) .50 (Phase 2)
	Enthusiasm for Study	.57 (Phase 1) .51 (Phase 2)

PART 3 General statistics (ASI)

Means and Standard deviations for the Entwistle sub-scales for Phase 1 and Phase 2 are given in TABLE 5.3 and TABLE 5.4 respectively. Those for the Factor sub-scales are given in TABLES 5.5 and 5.6 respectively.

Summary.

The proposed study and its research questions called for a complex and progressive kind of research design. Against this background, the present chapter has attempted to provide an overview of the two main scales that underpinned data gathering across both the Phase 1 and Phase 2 research designs. In the results chapters that follow, discussion follows the research questions as presented in FIGURE 5.1 (see earlier). The scales discussed in the present chapter apply to these questions.

TABLE 5.3. Means and standard deviations of the ASI (Entwistle) sub-scales and orientations for students in the longitudinal sample (1983, 1984, 1985).

	1983 n=86		1984 n=86		1985 n=81	
SCALE	Mean	sd	Mean	sd	mean	sd
DA	10.85	2.41	10.12.	2.72	10.28	2.55
RI	10.46	2.52	10.40	2.67	10.18	2.66
UE	8.74	2.70	8.37	2.82	8.97	2.40
IM	6.98	3.26	7.34	3.01	6.63	3.12
SA	14.39	3.69	14.92	3.45	15.63	3.70
SB	9.01	2.27	8.72	2.48	8.81	2.38
FF	6.42	2.89	6.14	2.88	6.44	2.88
EM	5.00	2.95	5.30	3.35	6.37	3.15
ST	11.48	2.47	11.65	2.63	11.79	2.66
DS	9.33	3.83	8.67	4.26	8.88	3.99
NA	5.50	3.26	5.64	3.36	7.62	3.10
AM	8.89	2.89	8.10	2.84	8.23	3.53
CL	8.81	3.36	8.52	3.69	8.42	3.43
GLT	7.95	3.50	8.57	2.78	8.04	2.78
OL	10.86	2.78	10.66	2.65	10.47	2.56
IP	8.64	2.82	8.89	2.95	7.59	2.96
MEANING	38.87	7.51	37.42	8.26	37.86	6.57
REPRODUCING	38.46	7.95	38.67	8.02	38.41	8.20
NON ACAD	22.01	6.44	21.80	6.45	24.07	6.35
ACHIEVE	27.35	5.48	27.09	5.05	26.65	6.39
SERIAL	19.50	4.43	19.56	4.64	18.06	4.67
HOLIST	16.77	5.38	17.09	5.31	16.45	5.0
PATHOL	16.59	5.35	17.46	4.35	15.63	4.54
VERSAT	19.67	4.06	19.19	4.05	18.89	3.73
SURCON	52.23	12.10	52.85	11.39	54.2	11.67
OPLEARN	54.38	8.50	54.85	8.73	54.29	9.44

TABLE 5.4. Means and standard deviations of the ASI (Entwistle) sub- scales and orientations for subjects in the cross-sectional sample (Years 1, 2 and 3 1987).

	Year 1		Year 2		Year 3	
SCALE	Mean	sd	Mean	sd	Mean	sd
DA	10.47	2.80	10.81	2.50	11.29	2.57
RI	10.24	2.64	10.95	2.63	11.46	2.58
UE	9.14	3.21	9.22	2.89	9.77	2.30
IM	7.08	3.34	7.45	2.93	7.76	3.35
SA	14.42	3.50	14.12	3.74	13.55	4.62
FF	6.20	2.74	6.11	2.72	5.97	3.07
EM	6.08	3.20	6.03	3.47	5.92	3.42
ST	11.51	2.35	11.61	2.26	11.93	2.29
DS	9.53	4.4	9.36	4.02	8.76	4.25
NA	6.51	3.21	6.73	2.29	6.91	3.63
AM	8.86	2.92	8.32	3.06	8.00	2.99
CL	8.65	3.39	9.56	2.97	9.29	3.25
GLT	7.33	2.82	7.66	2.60	7.86	3.51
OL	10.84	2.36	10.49	2.34	10.57	3.01
IP	8.30	2.58	8.07	2.82	7.48	3.30
MEANING	38.51	8.94	40.53	8.20	41.72	7.44
REPRODUCING	37.54	8.07	36.69	8.10	35.14	9.54
NON ACAD	23.40	6.77	22.53	5.90	22.36	6.16
ACHIEVE	27.46	6.09	27.39	5.57	27.67	5.09
SERIAL	19.14	4.16	18.56	4.49	18.05	5.27
HOLIST	15.98	4.72	17.22	4.32	17.16	5.44
PATHOLOGY	15.63	4.11	15.73	4.26	15.34	5.68
VERSATILE	19.49	4.08	20.05	3.58	19.86	4.23
SUR-CON	52.29	11.43	52.06	11.81	50.44	14.41
OPLEARN	53.64	7.95	52.68	8.33	51.84	10.20

TABLE 5.5. Means and standard deviations of the ASI (Factor) sub-scales and orientations for the subjects in the longitudinal sample (1983, 1984, 1985)

	1983 (n=86)		1984 (n=86)		1985 (n=81)	
SCALE	Mean	sd	Mean	sd	Mean	sd
F 1 (Dis-Dil)	9.26	3.86	8.69	4.26	8.88	3.99
F 2 (Open-Appr.)	15.34	4.55	15.35	4.67	15.35	4.01
F 3 (Care-Logical)	19.04	4.62	17.89	4.41	17.91	4.04
F 4 (Disgruntled)	6.23	3.44	6.59	3.51	8.36	3.02
F 5 (Enthusiasm)	3.98	2.21	4.38	1.98	3.96	2.24
F 6 (Safety-first)	9.49	3.33	9.38	3.17	8.40	3.05
F 7 (N.-Success)	9.20	3.23	8.37	2.84	7.99	3.24
F 8 (Superficial)	8.78	3.83	10.02	3.64	9.99	3.41
F 9 (Non-confident)	4.56	2.20	4.64	1.92	4.86	2.02
F 10 (Thoroughness)	7.36	3.31	7.33	2.98	6.43	2.74
F 11 (Init.-Explor)	6.22	2.65	5.90	2.65	5.93	2.55
F 12 (Voc. impetus)	2.76	2.09	3.34	2.17	3.49	2.18
ORIENTATIONS						
1. Superficial and Disinterested	36.76	10.74	37.59	10.83	40.83	10.02
2. Exploratory - -Logical	30.50	6.96	28.44	6.63	28.35	6.17
3. Achievement- -Structure	21.86	6.42	20.84	6.48	20.64	5.97
4. Adventurous- -Questioning	24.30	7.38	25.65	6.80	25.83	6.80
5. Non-confident- -Non risk	22.51	6.32	22.70	5.59	22.83	5.56

TABLE 5.6. Means and standard deviations of the ASI (Factor) sub-scales and orientations for the subjects in the cross-sectional sample (Years 1, 2 and 3, 1987).

	Year 1 n=136		Year 2 n=130		Year 3 n=102	
SCALE	Mean	sd	Mean	sd	Mean	sd
F 1 (Dis-Dil)	9.54	4.40	9.36	4.02	8.75	4.25
F 2 (Open Appr.)	15.55	4.16	17.29	3.81	17.25	4.03
F 3 (Care-logic.)	18.73	3.79	18.41	3.56	18.24	4.08
F 4 (Disgruntled)	7.18	2.96	7.74	2.92	7.66	3.12
F 5 (Enthusiasm)	3.84	2.05	4.40	1.89	4.45	2.00
F 6 (Safety-first)	8.96	2.87	8.54	3.03	8.49	2.90
F 7 (N. Success)	8.61	2.54	7.76	2.60	7.64	2.72
F 8 (Superficial)	8.85	3.59	8.94	3.50	8.86	3.94
F 9 (Non-confid.)	4.44	2.0	4.26	2.18	3.82	2.18
F 10(Thoroughness)	7.65	3.11	7.25	2.94	7.54	3.40
F 11 (Init.Explor)	6.26	2.57	6.18	2.54	6.54	2.54
F 12 (Voc.impetus)	3.54	2.71	3.44	2.21	3.35	2.34
ORIENTATIONS						
1. Superficial and Disinterested	38.08	11.12	38.39	10.61	37.28	11.51
2. Exploratory--Logical	29.43	5.63	29.14	5.31	29.36	5.98
3. Achievement--Structured	21.05	5.56	18.47	5.14	18.38	5.52
4. Adventurous--Questioning	24.83	6.14	26.89	5.58	27.08	6.34
5. Non-confident--Non risk	21.75	5.94	21.55	5.87	20.76	6.29

CHAPTER SIX

RESULTS: THE LEARNERS INTENTION WITH RESPECT TO STUDY STRATEGIES

As indicated in FIGURE 5.1, three questions were examined with respect to the learners' intentions. These focussed on:

(1) The stability (or variability) of individuals' approaches to studying and learning.

(2) The development of trends in approaches to studying and learning.

(3 The relationship between learning strategies and academic success.

The three research questions were:

QUESTION 1. To what extent will there be variability with respect to study strategies?

QUESTION 2. Will there be a general trend with respect to approaches to learning such an increase in deep-level processing?

QUESTION 3. How are the different approaches to studying related to academic success?

QUESTION 1. To what extent was there variability with respect to study strategies?

To answer this question we need consider only the data from Phase 1 (the longitudinal study). The relevant data are derived

from both the quantitative and qualitative methodologies relating to Phase 1. The results from these methodologies are viewed separately in the first instance, but then combined in a concluding statement.

(A) The quantitative data.

The source of those data was the Approaches to Studying Inventory (Entwistle and Ramsden, 1983). As described in Chapter Five both the Entwistle sub-scales and orientations, and the sub-scales and orientations derived from factor analysis of the Year 1 data were used. The sub-scales and orientations which seemed best to describe approaches to studying and learning were as follows:

From the ASI Entwistle scales
- Deep Approach (DA)
- Surface Approach (SA)
- Strategic Approach (ST)
- Disorganized Study (DS)
- Meaning Orientation
- Reproducing Orientation
- Non-academic Orientation

From the Factor scales
- F1 Disorganized and dilatory
- F2 Open, questioning approach
- F8 Superficial approach
- F10 Thoroughness
- F11 Initial-exploratory
- 01 Superficial and disinterested
- 02 Exploratory - logical
- 04 Questioning - adventurous

Note: The code F1, F2, ... indicates that the scale is one of the twelve scales derived from factor analysis of the Year 1 data in the present study. The code 01, 02 ... indicates factors derived from second order factoring of those data, referred to as Factor Orientations.

The second order factor 'Surface-confused' suggested by David Watkins (Watkins, 1982a), and used as the basis for the selection of one of the interview groups in the present study, was also included as a scale relevant to learning strategy as discussed in this section.

Method. An examination of sub-scale means from year to year does not give an indication of variability in individuals' approaches to studying and learning. Increases in the sub-scale scores of some individuals may be cancelled out by the decreases in the scores of others. Correlation procedures are the most appropriate here because correlation coefficients are based on the summed differences of individuals' scores from one testing situation to another. Thus the degree of variability for any sub-scale may be assessed by correlating the scores in Year 1 with those in Years 2 and 3, and also Year 2 with Year 3.

TABLE 6.1 gives the Pearson product-moment correlation coefficients for the various sub-scales associated with approaches to learning and studying.

Another correlation procedure which gives some idea of what is happening to individual scores from one testing situation to another is the cross-tabulation method (cross-tabs). With this procedure, the frequency distributions are grouped in some way, and the cross-tabs table illustrates how many subjects remain in the same group from one situation to another. There are, of course, a variety of ways in which frequency distributions may be grouped. In the present study several analyses were tried, such as having groups of equal n's (e.g. dividing the population into quarters), and organizing the frequency distribution into equal-interval groups. These methods gave fairly similar results, and in the method reported here five equal-interval groups were used. In this example, all the scores were first converted to standard scores with each distribution having a mean of 25 and a standard deviation of 8.0. The distributions were then recoded into equal-interval groups thus: group 1, scores between 0 and 9.99;

TABLE 6.1. Pearson product-moment correlation co efficient and levels of significance (two-tailed) for the Entwistle and Factor sub-scales across years.

	CORRELATIONS					
	Yr.1-Yr.2		Yr.1-Yr.3		Yr.2-Yr.3	
SCALE	corr	p	corr	p	corr	p
Deep approach	.45	.000	.29	.01	.35	.001
Surface approach	.34	.001	.24	.03	.36	.001
Disorganized study	.63	.000	.51	.000	.48	.000
Strategic approach	.37	.000	.38	.001	.58	.000
Meaning	.53	.000	.44	.000	.36	.000
Reproducing	.58	.000	.43	.000	.55	.000
Non-academic	.54	.000	.51	.000	.49	.000
Surface-confused	.60	.000	.43	.000	.56	.000
F1 Dis-dil	.63	.000	.51	.000	.48	.000
F2 Open approach	.48	.000	.50	.000	.67	.000
F8 Superficial	.53	.000	.48	.000	.39	.000
F10 Thoroughness	.58	.000	.37	.001	.42	.000
F11 Init'l explor.	.43	.000	.37	.001	.39	.000
01 Superf - disint.	.60	.000	.54	.000	.47	.000
02 Explor-logical	.42	.000	.30	.006	.44	.000
04 Quest'g-advent.	.57	.000	.47	.000	.75	.000

group 2, scores of 10 to 19.99; and so forth to group 5 which had scores between 40 and 50.

TABLE 6.2 shows the cross-tabulation table for the factor sub-scale orientation 1 (Superficial and Disinterested Approach to Studying). From inspection of the cross-tabulations in TABLE 6.2 it can be seen that in Year 2, 37 students remained in the

TABLE 6.2. Cross-tabulation table for the ASI Factor orientation Superficial and Disinterested. Year 1 with Year 2.

		YEAR ONE					
		1	2	3	4	5	Row total
YEAR TWO	1	1	2	1	0	0	4
	2	3	7	8	0	0	18
	3	1	8	21	11	1	42
	4	0	1	10	8	2	21
	5	0	0	1	0	0	1
Column total		5	18	41	19	3	86

Chi-square 27.67 df=16 $p < .03$

same group as they were in for Year 1, 44 students moved into adjacent groups, and five students moved into groups further than the adjacent group. This provided a fairly crude measure of variability: with a score difference of nine units from Year 1 to Year 2, a student could possibly remain in the same group e.g. a score of 30 in Year 1, and a score of 39 in Year 2 would be a case in point; on the other hand, a score difference of one unit could possibly place a student in an adjacent group. Two figures are of interest, however: the number of students remaining in the same group have a variation of 1.1 standard deviation units or less; students who moved beyond an adjacent group have variations of at least 1.4 standard deviation units. TABLE 6.3 gives the frequencies of students who remained in the same group; who moved across adjacent groups; and the chi-square significance for the relevant sub-scales and orientations between years. The

TABLE 6.3. Interpolations from cross-tabulation tables for the sub-scales of the ASI relevant to learning and studying strategies across years. Column (X) contains frequencies of students who remained in the same group from one year to another. Column (Y) contains the frequencies of students who moved across adjacent groups, and column (p) indicates the chi-square level of significance for the cross-tabulation.

	COMPARISONS								
	Years 1 - 2			Years 1 - 3			Years 2 - 3		
SCALE	(X)	(Y)	(p)	(X)	(Y)	(p)	(X)	(Y)	(p)
F1 (Dis-dil)	45	4	.000	37	9	.008	36	6	.01
F2 (Open-Ap)	41	5	.03	38	6	.03	46	3	.000
F8 (Superf'l)	43	7	.002	37	4	.18	39	9	.001
F10 (Thoro')	39	4	.01	23	5	.07	39	8	.04
F11 (In' exp)	41	10	.001	28	9	.47	38	11	.17
01 (SUP-DIS)	37	5	.035	36	6	.007	30	6	.011
02 (EXP-LOG)	47	9	.000	33	16	.41	37	8	.058
04 (Q.ADVEN)	46	5	.000	34	7	.022	42	2	.000
Deep-Appr.	31	8	.05	29	13	.26	39	11	.026
Surf-Appr.	38	8	.16	34	13	.015	38	12	.004
Strategic Ap.	42	7	.000	37	6	.01	40	3	.05
Disorg. St.	45	4	.001	37	9	.01	36	6	.01
MEANING	36	3	.000	38	10	.09	32	5	.24
REPROD.	38	3	.002	37	6	.04	40	6	.01
NON-ACAD.	41	4	.01	40	6	.000	42	5	.001
SURF-CONF.	27	4	.007	38	6	.005	36	5	.03

difficulty in interpreting these figures lies mainly in deciding at what point a scale may be categorized as stable, and the confounding of the issues of scale reliability and student variability with respect to any of the constructs being

considered. The size of the correlation coefficients certainly implies that the degree of variability is not very great, and relatively few students differed in their sub-scale scores from year to year by more than 1.5 standard deviation units.

Considering these data at a very general level, it can be seen from TABLES 6.1 and 6.3 that the greatest levels of test-retest correlations were between Years 1 and 2, and the lowest correlations were between Years 1 and 3 (ten of the coefficients for the Years 1 and 2 comparisons were greater than .50, whereas only five exceeded .50 for the other two comparisons).

The scales in which student scores appeared to be <u>most stable</u> were:

1. Entwistle Scales	Disorganized Study
	Reproducing Orientation
	Surface-confused Orientation
	Non-academic Orientation
2. Factor Scales	F1. Disorganized and Dilatory
	F2. Open Questioning Approach
	O1. Superficial-disinterested Orientation
	O4. Questioning and Adventurous Orientation

The scales in which student scores appeared to show the <u>greatest variability</u> were:

1. Entwistle Scales	Deep Approach
	Surface Approach
	Strategic Approach
2. Factor Scales	F11. Initial-exploratory
	O2. Exploratory - Logical Orientation

One interpretation of the above is that most variability took place in scales that were more open to influence by the nature of the task. The more stable strategies seemed to consist of more general attributes that were more likely to be less influenced by the nature of the task. For example, the literature has suggested that deep and surface-level approaches are task dependent for many students (Laurillard, 1979; Brumby, 1982), and it may be reasoned that if a student is disorganized and dilatory, it is likely that she or he will display this behaviour across tasks.

Other data, however, would appear to contradict the notion of stability of at least one of the scales which are indicated as relatively stable above. It will be recalled that a sub-group of the interview sample was selected on the basis of their having high scores on the Surface-confused Orientation in their first year. It can be seen from TABLE 6.4 that by the second year, the Surface-confused group (so called) were not much different from the Random group, or from the general population with respect to their mean score on the surface-confused scale. This apparent lack of stability may have been a feature of that particular group (as is discussed later) but another explanation may be related to the phenomenon of regression to the mean. The small number of students at an extremity of a scale of measurement can really only shift in one direction, which is towards the mean.

TABLE 6.4. Mean scores on the surface-confused orientation of the ASI for the Surface-confused group (n=12), and the Random group (n=20) for each year of study.

GROUP	Year 1	Year 2	Year 3
Surface-confused	68.3	57.6	58.9
Random	55.5	58.2	57.1
Total population	52.2	52.8	54.2

(B) The Qualitative Data.

One problem with the above analyses is that student variability with respect to any sub-scale from one year to the next, is inevitably confounded with the issue of scale reliability. The more unreliable a scale, the greater is the degree of diversity that would be expected in a test - retest situation. Another way of assessing variability is to determine the degree to which students adopted one approach for one task, and a different approach for another task. This kind of information was obtained from interviews with the Surface-confused and Random groups (n=32).

It should be noted that a second problem arose when comparing the quantitative data with the interview data. The ASI distinguishes the Surface Approach from the Reproducing Orientation (the latter comprises the sub-scales Syllabus Bound, Fear of Failure and Improvidence, as well as Surface Approach. It was much more difficult to conceptually distinguish these constructs when analysing the interview data. In reporting the interview results, then, these terms tend to be used synonymously.

In Interview One, students were asked whether the study technique they had described was the same for all subjects, and they were also asked if they were satisfied with the approach they used. In Interview Five, they were asked whether they consciously adopted different approaches to their study of different subjects. The responses to these questions are described below.

Interview One: Was this technique the same for all subjects? TABLE 6.5 gives a breakdown of the replies to this question for the Surface-confused group (n=12), and for the Random group (n=20). From TABLE 6.5 it can be seen that 75 percent of students in the interview sample said that they did use the same approach for different subjects. In most cases the approach they described indicated surface - level processing. For example:

TABLE 6.5 Number of students in the Surface - confused (Surcon) group and the Random group, who said that they used the same approach or different approaches to different subjects. (Year 1)

	APPROACH		
GROUP	SAME	DIFFERENT	(n)
SURCON	11	1	12
RANDOM	13	7	20
TOTAL	24	8	32

Chi-square 2.83 (not significant)

"Yes, I usually go over old exam papers, summarize all my notes, make key words and phrases to remind me of sections - then just try to memorize the main points."
(Subject 91 F. R)

Students who said that they used different approaches usually gave examples, such as studying for a maths exam was different from studying for a history exam; or, they studied biology in a different way from studying music.

In Interview Five when the same question was asked, only 39 percent of the students said that they adopted the same approach across all subjects. The 61 percent who said that they varied their approach, however, mostly talked about the time factor. They spent more time on some subjects than they did on others. For example, subjects that had an examination were given more time than subjects that were evaluated on course work. Subjects that gained university degree credit were given more time than subjects that did not. Only a few students considered that

different subjects may require different mental operations -- for example, problem solving and deductive reasoning for mathematics, and reflection and/or attempts to memorize details for geography. The students who said that they adopted the same approach for all subjects often qualified their answer by saying that their approach seemed to work for them, and that was all that mattered.

As in Interview One, students who adopted the same approach to studying for different subjects almost universally described surface - level processing or strategic strategies. In several of the interviews, students were asked whether they put most time and effort into subjects that interested them, or into subjects in which they were weak, or into subjects with the greatest work loads. The students who had described surface-level processing, or strategic approaches to learning, invariably said that they put most effort and time into the latter categories. Students who described meaningful and questioning approaches to studying, on the other hand, put most time and effort into subjects that interested them; they often expressed frustration with the fact that they would put so much time into the one or two subjects they liked, that they put off work on subjects they disliked or were not interested in and were thus forced into last minute surface learning strategies for these latter subjects.

The ASI profiles for these students usually reflected high levels of surface-level processing. This was particularly the case for the students in the surface-confused group. The significant point, however, was that these students used meaningful or deep-learning strategies for subjects they liked, and that, usually because of pressure of time, used reproducing strategies for other subjects. Students who used the same approach to learning over the three years of their teacher education programme invariably used surface-level, reproducing strategies. This finding from the interview groups would again appear to go against the findings suggested by the quantitative analysis of the whole population responses to the ASI which suggested that the Surface approach to learning was relatively

unstable across years. It does, however, support the work of Svensson (1977) who reported that surface-level processors found it more difficult to adapt to the needs of different tasks than did deep-level processors. TABLE 6.6 illustrates this effect rather dramatically. Students in the surface-confused group were significantly different from the random group with respect to their attribution of effort, in a manner that is rather unexpected (one would expect them to adopt a surface approach exclusively, by virtue of the criteria for selection to that group). Of course time spent in studying a subject may not of itself be an indicator of deep-level processing, but other indicators from the interviews suggested that for this group there was a strong correlation between time spent, interest, and attempts to gain understanding.

TABLE 6.6. Number of students in the Surface-confused and Random groups in Year 1 who said that they put most time and effort into courses they were interested in, and the number of students in these groups who put most time and effort into courses they had difficulty with, or that had the greatest workload. (Year 1)

	ATTRIBUTION OF EFFORT		
GROUP	Interest/liking	Need/w.load	(n)
Surcon	10	2	12
Random	7	13	20
Total	17	15	32

$\chi^2 = 6.39$; $p < .02$

The four students in the interview sample who clearly adopted a strategic approach, tended to maintain that approach throughout. For example, subject 39, a female student in the Random group, described how she went about essay writing in her first year thus:

> *"You've got to get used to the lecturers and their ways - find out what they think - what their bias is. I read through the texts and notes I've got...*
> Interruption from a rather incredulous interviewer..."Do you mean to say that you adapt your essay to what you think the lecturer thinks?"
> *"Oh yes. You've got to in a place like college. Its a matter of survival! Like you get someone's essay from last year on the same topic, look at the comments the lecturer made - boy thats a big help! It didn't work last time though - a different lecturer marked mine!"*

Two years later, this student still adopted a cue-seeking approach, and was very highly organized. When asked at the end of the third year whether she had changed in the way she went about studying since her first year, she replied rather tartly, *"Oh, I haven't had time to study this year, so the question is rather irrelevant!"* A little further on she was talking about the very heavy workload she had endured in the final year, and how difficult it was to cope because she had a part-time job as a telephonist every evening during the week and occasionally at weekends, and also conducted dancing classes two half-days a week in a private school. When asked to explain how she managed, she produced a marvellous study schedule, colour coded for subjects, and detailed to make use of every spare minute during the day. Yet she had said that she didn't have time to study! This student incidentally, graduated with distinction!

Concluding statement.

The question "To what extent will there be variability with respect to learning strategies?" has at least two interpretations. It can mean "To what extent will a student be

consistent with a particular approach to learning, from one period in time to another?", and it can mean "To what extent will students vary their approach to learning from one task to another?". The two interpretations or ways of looking at variability of approach to learning can easily be confounded.

In considering the first interpretation, we tend to ignore task differences, and regard an approach to learning as a characteristic of a student. As discussed in the review of the literature, there are researchers in the field who would suggest that approaches to learning are not so much characteristics of students, but descriptions of student behaviour with respect to specific tasks (Entwistle and Ramsden, 1983; Laurillard, 1979). The results from the present research seem to indicate that some of the learning approaches were relatively stable, and may well constitute a student characteristic - in effect, a learning style. These particular approaches were those related to organization of study, negative attitudes to learning, and an intention to reproduce the material rather than integrate it.

The relative stability of these approaches was confirmed when the second interpretation of the question - variability across tasks or subjects - was considered. Students who claimed to use the same approach to different subjects almost invariably described that approach in classical 'reproducing intention' terms.

For the students in the interview sample at least, the stability of the reproducing approach (to the extent that it had become *a consistent and preferred way* of approaching a learning task) appeared to be a reflection of practices in secondary schools. In the first interview, students were asked whether they had received advice about how to study when they were at school, and then were asked to describe the kind of advice they had received (see Interview One summary, APPENDIX B, p.41-42). A total of 70 percent of the students interviewed said that they had received advice, and in every case they went on to describe strategies dealing with organization or memorizing. There was

not a single instance of advice consonant with a deep- level approach such as relating ideas, forming analogies and putting learning into their own words.

Another interesting finding from the interview data, was that many students in the Surface-confused group appeared to be frustrated deep learners! In Year 1 this group, with the exception of one student, professed to use the same surface-level approach to all subjects (but also said that they spent more time on the subjects that they were interested in), and also expressed far more dissatisfaction with their mode of study than did the other students. In the third year, these students tended to be more versatile, utilizing a deep approach for subjects they liked or were interested in, but utilizing reproducing strategies for subjects that did not interest them.

Relatively few students in the interview sample described a strategic approach to learning, but those who did maintained that approach throughout the three years - probably because it was successful for them.

QUESTION 2. Were there general trends with respect to approaches to learning - such as an increase in deep-level processing?

Quantitative and qualitative data from both phases of the study had relevance for the consideration of trends. From the longitudinal phase there were the ASI sub-scales that have already been discussed in dealing with Question 1, as well as the data from the five interviews. From the cross-sectional phase there were the ASI data again, as well as relevant information from the staff interviews.

(A) The Quantitative Data: Phase 1.

Analyses of variance were carried out for all the scales related to approaches to studying and learning. These were repeated measures analyses, and several tests for homogeniety of variance such as the Greenhouse-Geisser and Mauchly sphericity tests were applied. Corrections to counteract homogeneity bias by adjusting the df's, included the Pillais, Hotellings, and Wilks procedures. TABLE 6.7 provides an example of the analysis of variance statistics for the sub-scale F10 Thoroughness in Approach to Learning (the full complement of ANOVAS, being too bulky even to include in an apppendix, is available from the researcher).

TABLE 6.8 provides the details of these analyses. The means of the sub-scales for Years 1 and 2 differ slightly from the means reported in TABLES 5.3 and 5.4. This is because five subjects who had dropped out after completing the ASI in Year 2 were not included in the repeated measures analysis.

Significant F's for the factor Years occurred in only two of the Entwistle scales, and in four of the Factor scales. For those sub-scales which yielded significant F's, t-tests for related samples were carried out to determine which comparisons (of years) were significantly different. The trends were also noted.

From these results it can be seen that there is an increase in the Surface Approach to learning over the years. The trend is linear, but only the Year 1 and Year 3 means are significantly different at the $p < .05$ level. There is also an increase in the Non-academic Orientation means over years, particularly from the first and second years to the third year. The Non-academic Orientation has a motivational component, consisting as it does of the sub-scales Disorganized study, Negative attitudes, and Comprehension learning (negative), and this possibly accounts for the size of the differences (in

TABLE 6.7 Manova statistics for the Thoroughness in Learning sub-scale of the ASI.

TESTS OF BETWEEN SUBJECTS EFFECTS

Tests of significance of T1 using unique sums of squares.

SOURCE OF VAR'N.	SS	DF	MS	F	Sig. of F
Within cells	1326.6	80	17.16		
Constant	11851.07	1	11851.07	690.72	.000

TESTS INVOLVING TIME WITHIN SUBJECT EFFECT

Mauchly Sphericity Test W= .96028
Chi square Approx. 3.2
Significance .20

Greenhouse-Geisser Epsilon = .96179
Huynh-Feldt Epsilon = .98500
Lower-bound Epsilon = .5

EFFECT TIME
(Multivariate tests of significance (S = 1, M = 0, N = 38 1/2)

Test name	value	Exact F	Hypoth df	Error df	sig.
Pillais	.07654	3.27375	2.0	79	.043
Hotellings	.08288	3.27375	2.0	79	.043
Wilks	.92346	3.27375	2.0	79	.043
Roys	.07654				

(F statistics are exact)

TESTS INVOLVING TIME WITHIN SUBJECT EFFECT
Averaged tests of significance for MEAS.1 using unique SS.

SOURCE OF VARIATION	SS	DF	MS	F	Sig. of F
Within cells	760.29	160	4.75		
TIME	37.05	2	18.15	3.90	.002

TABLE 6.8 Approaches to studying and learning sub-scales which had significant F's in the analyses of variance for dependent variables (sub-scales) with repeated measures over the factor Time. The comparisons between Years which were significantly different on T-tests are indicated in the final three columns.

		SUB-SCALE MEANS YEAR			Level of Significance of comparisons YEARS		
Sub-scale (Entwistle)	overall F	1	2	3	1 - 2	1 - 3	2 - 3
Deep Appr.*	.19	10.65	10.06	10.28	.03		
Surf.Appr.	.05	14.48	15.02	15.63		.03	
NON-ACADEM.	.006	22.21	21.93	24.07		.01	.01
Sub-scale (Factor)							
F8 Sup'f'l	.016	9.02	10.15	9.99	.002	.02	
F10 Thoro.	.04	7.28	7.23	6.43		.02	.02
01 S-disint	.005	37.51	37.80	40.83		.003	.01
02 Expl-log	.035	30.27	28.17	28.34	.01	.03	

* This sub-scale is included even though the overall F is not significant - see explanation below.

Chapter Seven it will be seen that motivation generally dropped away in the third year). The means of the factor scales Superficial Approach to Study, and the factor orientation Superficial and Disinterested show an increase over the three years, while the Thoroughness in Study and Exploratory-logical scales show a decrease. The Entwistle sub-scale Deep Approach also showed a decrease over the three years, but the overall F-test was not significant. Strictly speaking, therefore, the t-tests comparing the means from year to year for this sub-scale should not be considered, but they have been included in TABLE 6.8 in order to show the general trend.

These results support the finding by Watkins and Hattie (1983), whereby students at the Australian National University

appeared not to develop towards more meaningful approaches to learning over three years but revealed instead a trend towards an increase in surface-level strategies. In the longitudinal phase of the present study, students also appeared to increase in surface-level and superficial approaches to learning and studying, with decreases as a function of time in a deep approach, thoroughness in study, and the approach whereby students explore the subject matter widely before adopting an analytic approach to the completion of a learning task.

(B) The Qualitative Data: Phase 1.

In the course of the interviews, two questions were put to students concerning changes in approach to studying over time. In Interview One the period in question was from leaving school to the time of the interview (which was at the end of the first year). In Interview Five the period in question was from the first year up to the time of the interview, which was at the end of the third year.

Interview One. Approximately 41 percent (n=13) of the students in the interview sample said that they had changed with respect to their approach to studying and learning, and the change was in a positive direction. Students in the surface-confused group described the change as mainly putting less emphasis on reproducing or surface-level strategies. For example:

> *"I think so ... not in the time I put in, but the way I approach it is different.*
> (Do you still take notes and summarize a lot?)
> *"Yeah, ... but I use a lot more texts to sort of back up what I'm saying. We're told to look critically at things rather than just repeat notes. I never used to do that"*
> *02 F. (S)*

> *"I suppose I've refined it a bit... instead of going out and summarizing everything, I've taken time to read a bit more. I try to generalize instead of copying everything."* 23 M. (S)

The randomly selected group of students described similar changes, but several also mentioned being better organized.

Approximately 17 percent (n=5) of the interview sample felt that they had changed in negative way. Usually this was related to experiencing difficulty in settling into a new environment.

> *"I have, but I don't think it is for the better. I can't seem to settle down to studying like I used to. There's a lot of distractions in the Halls (of Residence), and there's loneliness. You wouldn't think that you could be lonely in the Halls, but you can. I'm used to having my family around. Its so different, and I'm so unsettled."* 88 F. (R)

Approximately 44 percent (n=14) of the interview sample said that they had not changed. As mentioned earlier, almost all these students described their approach to studying in terms of reproducing or strategic strategies.

To summarize, approximately 41 percent of the first year students in the interview groups claimed to have changed in what they saw as a positive direction - placing less emphasis on surface learning, and/or being better organized. About 17 percent thought that they had changed for the worse, having difficulty in applying themselves to study in new surroundings. Approximately 44 percent thought that they had not changed. There were no significant between- group differences.

At the end of the <u>third</u> year, approximately 74 percent (n=23) of the students reported that they had changed in a positive manner. These changes could be categorized broadly into two categories- <u>meaningful</u> learning and <u>operational</u> learning (the latter was defined by Entwistle and Ramsden (1983) as "the facet of learning process concerned with mastering procedural details." (p.26). The following excerpts from the interview transcripts illustrate both categories.

(a) Meaningful learning.

"It probably has changed, though its hard to remember what I did in the first year. I'm sure there's a lot less of trying to remember screeds of stuff and then regurgitating it. I put a lot more effort into understanding what I read and thinking about it." 13 F. (S)

(b) Operational learning.

"Yes, I'm more organized now. I follow the course outlines and study guides carefully to make absolutely sure I know what's expected of me. I haven't got so much time now, so I make the best use of the time I've got." 68 F. (R)

TABLE B.11 in the 'Interview Five summary' (APPENDIX B.3, p.71) shows that there was a between-group difference with respect to the meaningful or operation learning descriptions of improvement. Operation learning was principally a feature of the Random group, and the change to meaningful learning a feature of the Surface-confused group. Altogether in Year 3, approximately 26 percent (n=8) of the interview sample described changes indicative of a deeper approach to learning. Approximately 45 percent (n=14) described changes in terms of being more efficient and better organized. Only three students thought that they had changed in a negative sense from Year 1 to Year 3. Two of these had motivational problems, and the third described a change from being a deep-learner in Year 1 to a surface-learner in Year 3 and he ascribed this to pressures from part-time work and very heavy workload.

Only five students said that they had not changed their approach since Year 1. In each case they claimed to have had a fairly effective approach when they came to college, and saw no reason to change it.

It is important to note that the trends claimed by students in the interview sample seem to go against the general trend of the population as indicated by the quantitative data. Several possible explanations may be offered concerning this finding.

One is to question the accuracy of the student perceptions when they described how they had changed; another may have to do with the test-retest reliability of the ASI; and there is the possibility that participating in the study (i.e. being interviewed five times) had a special effect on some of the interview group.

The first of these possible explanations is the least likely. Students who said that they had changed towards a more meaningful approach for example, usually confirmed this when they described how they were going about specific learning tasks. The word "usually" is used because, as already noted, some students did change their approach depending on the nature of the task. The question in Interview Four which asked students to explain standard deviation in their own words, is an example of a useful check on their claims. For example, students who claimed that they were attempting to develop a more meaningful approach to learning could usually give a reasonable explanation such as the following:

> *"Its the spread of scores around a mean. Its a unit that describes the spread of scores, like whether there is a narrow distribution or a wide one, the s.d. will tell you that. This is hard - but I know what it is! Like a test will have a s.d. which gives you an idea of the variability, and with a normal distribution approximately 68 percent of the scores will fall in the range of plus or minus 1 s.d."* 35 F. (R)

On the other hand, students who described surface approaches to learning usually had little idea of the concept of standard deviation or remembered formulae or figures like the following:

> *"Well you've got a middle score ... and its how far you are away from that."*
> (So, if a test has a mean of 50, and my score is 70, my s.d. would be 20?)
> *"Yes, that would be right, and 34 percent are one s.d. above the mean."* 60 F. (R)

The reliability of the ASI always remained a problem, but one would expect unreliability to produce variable or random effects, not the fairly consistent trends which did develop.

The effect on the participants of taking part in the study seemed, however, to be a real factor. In Interview Five, students were specifically asked whether taking part in the study had changed (a) their way of going about studying and learning, and (b) their attitude towards studying and learning. 61.3 percent (n=19) of the sample said that their way of going about studying had been affected; that mainly it was to make them more aware of what they were doing. The general response is summed up by this statement:

> *"Yes, it has made me more aware. I've thought about study and motivation - it made me periodically check my goals - that was good for me." 44 F. (S)*

With respect to attitude change, only about 39 percent (n=12) said that their attitudes towards studying had changed, and these students were mainly in the surface-confused group (see TABLES B.12 and B.13 in APPENDIX B). The majority of the students thought that their attitudes towards studying and learning had always been positive.

Further information about the effects of participation in the study comes from the quantitative data. Participation appeared to have had a differential effect, acting mainly on the Surface-confused group. FIGURE 6.1 reveals the trends with respect to the factor sub-scale 10 (Thoroughness in approach to study). It can be seen that the Random group followed the main trend of the general population (and also the students who were not interviewed). Only the Surface-confused group went against the trend. Similar, though not always so dramatic differences, appeared for the other sub-scales relevant to approaches to studying and learning. It seems likely that being interviewed frequently had a particularly beneficial effect on the Surface-confused group, perhaps because, as discussed in Chapter Seven, most of their 'problem' - that put them in that group in the

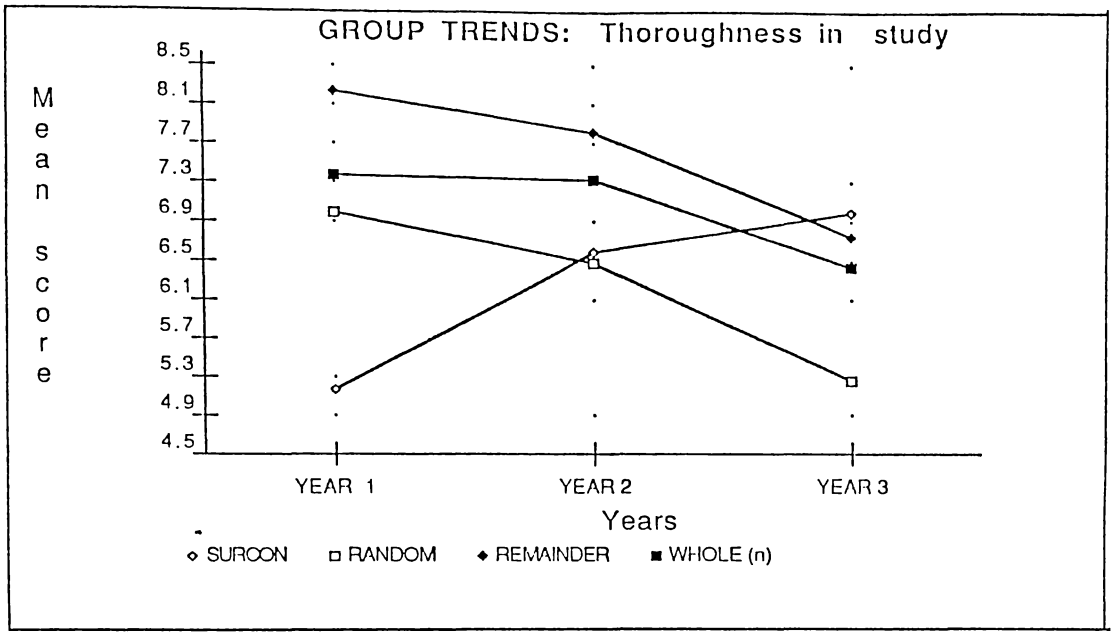

FIGURE 6.1. Trends over three years for Factor sub-scale 10 Thoroughness in Study, for the Surface-confused, Random, the Non-interview group, and for the whole population.

first place - was motivational and attitudinal, factors that are readily influenced by frequent contact with a sympathetic staff member.

In summary it can be said that the main trend (towards increasing surface-level strategies) found in the Watkins and Hattie (1983) study with Australian students was replicated here. This trend did not appear to the same extent in the qualitative data, however. Most of the students interviewed thought that they had improved over three years, but most of this improvement was in terms of efficiency and organization and not in moves towards deeper learning strategies. Students who went against the trend were mainly in the Surface-confused group, and it is likely that the effect of participating in the interviews particularly affected this group.

(C) The Quantitative Data: Phase 2.

The trends in approaches to studying and learning described above did not appear in the cross-sectional phase. While only three of the sub-scales (Deep Approach, Meaning Orientation, and the Open Questioning Approach) produced F-ratios which were significant at less than the .05 level when the one-way analyses of sub-scale with years were performed, it is apparent from an inspection of the means in TABLE 6.9, that the trends for Approaches to Studying generally were in the reverse direction from those in the longitudinal phase (it should be noted too that the Reproducing Orientation had an F that was close to reaching significance).

TABLE 6.9 Means for each of the ASI sub-scales associated with approaches to studying and learning for each year of study of the Division A students at Hamilton Teachers College 1987.

Sub-scale or Orientation	YEAR 1	2	3	Oneway sig.of F	Comparison Scheffé p<.05 1-2	1-3	2-3
Deep Approach	10.47	10.81	11.29	.05		*	
Surf. Aproach	14.40	14.12	13.49	.20			
Disorg. Study	9.54	9.36	8.74				
Strat. Approach	11.52	11.61	11.93				
MEANING	38.51	40.53	41.72	.01	*	*	
REPRODUCING	37.54	36.69	35.14	.09			
SURFACE-CON.	52.29	52.06	50.44				
NON-ACADEMIC	23.40	22.53	22.36				
F1 Dis-dil	9.54	9.36	8.75				
F2 Open-appr.	15.55	17.29	17.25	.002	*	*	
F8 Superficial	8.85	8.94	8.86				
F10 Thorough	7.65	7.25	7.54				
F11 Init'l Expl.	6.26	6.18	6.54				
SUP'F'L. DISINT.	38.08	38.39	35.27				
EXPLOR-LOGICAL	29.43	29.14	29.36				
QUEST-ADVENT'S	24.83	26.89	27.08				

In the cross-sectional population, the differences in means, while small and generally non-significant, were towards more meaningful approaches over the three years. Scales which were significantly different across years in the longitudinal phase, such as Reproducing Orientation, Non-academic Orientation, Superficial Approach and Disorganized Study, were in the opposite direction.

While it is tempting to conclude that the new college programme introduced in 1984 could be a factor in producing these rather positive results from the cross-sectional phase, analysis of the population characteristics of students in the two phases reveals that another factor, age, could be an alternative explanation.

In Chapter Four it was noted that a major difference between the subjects in the longitudinal phase of the study, and those in the cross-sectional phase, was that the latter were far more heterogeneous with respect to age. The ages of these students in the 1983 intake were within a very narrow age bracket (for the most part they came to college straight from school). After 1983 there was a trend to accept older people into college , and each of the years in the 1987 phase had a considerable range in ages (see TABLE 4.6 in Chapter Four, p.107)

Two-way analyses of variance for each dependent variable with year and age were performed. The 'year' groups were first year, second year, and third year students in 1987. The 'age' categories were as follows: under 18 - group 1; 18 years - group 2: 19 years - group 3; 20 years - group 4; 21-24 - group 5; 25 years and over - group 6.

The cell means for each of the year by age categories for the variable Deep Approach are presented in TABLE 6.10(a). The two-way analysis of variance for these cell means is given in TABLE 6.10(b). The two empty cells in TABLE 6.10(a) result from the fact that there were no students under 18 years of age in Years 2 and 3.

TABLE 6.10(a). Cell means for the variable Deep Approach to studying for age categories and year. (Cross-sectional phase)

		AGE CATEGORY					
		1	2	3	4	5	6
YEAR	1	9.5	10.24	10.23	9.78	12.08	13.1
	2		10.86	10.36	10.53	11.56	13.4
	3		12.33	10.5	11.06	11.21	12.28

TABLE 6.10(b). Two-way analysis of variance for the variable Deep Approach to studying, by age and year of study.

TESTS OF SIGNIFICANCE FOR DA USING UNIQUE SUMS OF SQUARES					
Source of variation	SS	df	MS	F	Sig of F
Within cells	2278.55	352	6.47		
AGE	188.59	5	37.72	5.83	.000
YEAR	7.05	2	3.52	.84	.581
AGE x YEAR	44.11	5	5.51	.85	.558

The main effect results in TABLE 6.10(b) show that the differences in the means for Deep Approach across years could be attributed to age rather than year of study. As indicated in TABLE 6.10(a), older students, whether in their first, second, or third year of study tended to have higher scores in the Deep Approach scale than younger students. Because age was an uncontrolled variable, an analysis of co-variance was the appropriate test to see whether age rather than year of study was the factor influencing these means. TABLE 6.10(c) presents the covariance details. These results confirm the suggestion that age, rather than year of study was the significant factor

contributing to the differences in means across years for the variable 'deep-approach to study'. In the Watkins and Hattie (1981) research, the age factor was also found to be significant and they suggested that the age differences might be independent of sex, faculty or year of study.

There was some concern whether the empty cells (TABLE 6.10a) were unduly influencing the significance of the F's in the analyses of variance and covariance. A check on this was made by deleting the age category 1 altogether. When this was done and a completely balanced design was formed, the significance of the F's for Deep Approach were .000 for age, and .697 for year, and .558 for the interaction effect. Thus, it is apparent that the SPSSx programme treated the empty cells as null, and not as zero scores.

TABLE 6.10(c) Analysis of covariance for the variable Deep Approach to study by year of study with age as the covariate.

TESTS OF SIGNIFICANCE FOR DA USING UNIQUE SUMS OF SQUARES					
Source of variation	SS	df	MS	F	Sig of F
Within cells	2375.75	364	6.53		
REGRESSION	145.5	1	145.5	22.29	.000
YEAR	.75	2	.38	.06	.994

TABLE 6.11 provides a summary of the levels of significance of F for the factor 'year', with the covariate 'age' for the other sub-scales and orientations relevant to approaches to studying and learning.

Age, then, appeared to be the main factor in all the relevant sub-scales with the exception of Disorganized Study, Strategic Approach, Disorganized and Dilatory, and Exploratory-logical. These particular sub-scales and orientations were those found to be most stable from year to year in the Phase 1 (longitudinal) study.

TABLE 6.11 Levels of significance of F for the factor Year of study, and the covariate Age, for the sub-scales and orientations relevant to approaches to studying and learning.

SCALE	YEAR	AGE
Deep approach	.94	.000
Surface approach	.83	.000
Disorganized study	.77	.26
Strategic approach	.22	.32
MEANING	.45	.003
REPRODUCING	.77	.000
SURFACE-CONFUSED	.59	.000
NON-ACADEMIC	.76	.007
F1 Dis-dilatory	.77	.26
F2 Open approach	.02	.004
F8 Superficial	.186	.001
F10 Thoroughness	.042	.000
F11 Init'l-exploratory	.7	.02
01 SUPERF'L DISINT'D	.17	.000
02 EXPLOR-LOGICAL	.89	.83
04 QUEST'G-ADVENT'S	.11	.01

These results suggested that the different trends in the approaches to studying of the longitudinal and cross-sectional populations was due primarily to the fact that the latter group had a considerable number of older students. Older students tended to adopt more meaningful approaches to learning independently of length of experience in the teachers college.

Age, however, did tend to be confounded with overall tertiary experience. A check on the entry qualifications of all Year 1 students in 1987 revealed that 11 out of the 23 students who were 21 years of age or over did, in fact, have previous university experience. The number of papers passed ranged from 1 to 12 with a mean of 4.7. An interesting point, however, is that the ASI means on Deep Approach, Surface Approach, Meaning and Reproducing Orientations for the Year 1 longitudinal population and the Year 1 cross-sectional population were not markedly different. In other words, previous tertiary study seemed to make little difference in the first year but appeared to do so in succeeding years.

QUESTION 3. How are the different approaches to studying related to academic success?

Several measures of academic success were available during the three years of the longitudinal study. At the end of the first and second years, for example, student grades in certain core subjects were accumulated and, on the basis of the summed grades, students were awarded A or B bursaries (or no bursary) for the following year (bursaries consisted of modest financial grants). The problem with this as a measure of academic success has already been discussed in the Methods chapter: such a measure would have included subjects that were not common to all students, as well as Liberal Studies, which ranged quite widely in terms of academic difficulty level. It was felt that only subjects taken by all students, and subjects which gained university credit, should be used as measures of academic success. The education courses Human Development and Issues in Education met these criteria for the first year, while Learning and Teaching and Studies in Teaching (Maths and Language) were eligible second year subjects.

Another measure of academic success, although conflicting with the strict criteria listed above, was the award level attained by students at graduation. This was explained earlier (see Chapter Three, p.92). Briefly, this consisted of an academic grade and a teaching practice grade combined to give a total grade reflecting a student's performance over the entire three year preservice programme. On this basis, students were awarded a teaching diploma with Distinction, Commendation, or Ordinary. The academic scores which contributed to the total grade were also used as a measure of academic success for the present study. These were ranked, and the top 12 percent labelled '**Distinction**', the next 30 percent '**Commendation**', and the final 50 percent '**Ordinary**'. The percentage cut-off points approximated those used for the graduation categories, the difference being due to the frequency-distribution cut-off points

for discrete student numbers. These labels do not match the graduation lists exactly, because these included the teaching practice scores. For example, a student could graduate with distinction even if his/her academic performance was only moderately above average, if his/her teaching practice component was outstanding. In over 90 percent of the cases however, there was a match. The main point is that the labels used in this analysis are simply terms used to describe levels of academic achievement.

Because indicators of academic attainment were not available for the subjects in Phase 2 of the research, only the data from Phase 1 were relevant for this question.

(A) The Quantitative Data.

1. Correlations of Approaches to Studying with Academic Performance.

Correlations were computed for the final grades in Year 1 and 2 Education courses listed above and the relevant sub-scales of the ASI (see p.128 of this Chapter). Out of the 32 correlations involved, only the following had significance.

For Year 1 the Entwistle sub-scales Disorganized Study and Non-academic Orientation correlated negatively with the academic grade:

Disorganized Study: Pearson corr. $-.31$ ($p < .00$)
Non-academic: Pearson corr. $-.23$ ($p < .03$)

The Meaning Orientation correlated positively with the Year 1 final grade. Pearson corr. coefficient .21 ($p < .05$)

In Year 2, Disorganized Study and the Non-academic

Orientation again had significant negative correlations, as had the Factor scales Disorganized and Dilatory, and the Superficial - disinterested Orientation. The coefficients and probability levels were as follows:

Disorganized study:	Pearson corr. -.39	($p < .00$)
Non-academic:	Pearson corr. -.27	($p < .01$)
Disorganized dilatory	Pearson corr. -.39	($p < .00$)
Superficial-disinterested	Pearson corr. -.31	($p < .01$)

The Strategic approach to studying correlated positively with the second year academic results (corr. .21 $p < .05$)

These results are quite in line with the results from previous studies. Disorganized Approach and Negative Attitudes (a sub-scale incorporated into the Non-academic Orientation) have been the ASI sub-scales that have most consistently related to low academic performance (Watkins, 1982a; Entwistle and Ramsden, 1983).

2. Analyses of Variance.

Analyses of variance of the Approaches to Studying scales with Final Academic Grade and Year of Study.

TABLES 6.12(a) and 6.12(b) give the cell means for the two independent variables Graduation Category and Year of Study for each of the dependent variables associated with approaches to studying and learning. The MANOVA model is a two-factor, mixed, repeated measures design, with Graduation Category the between -subjects factor, and Year of Study the within-subjects factor.

TABLE 6.13 gives the MANOVA details for the dependent variable 'Non-academic Orientation to studying'. The full complement of the MANOVAS are available on request from the present researcher.

TABLE 6.12(a) Cell means for the approaches to studying and learning (Entwistle sub-scales and orientations), for Final-Grade Academic categories with Year of Study. The significance of the F-ratios produced by one-way analysis of variance, and the comparisons between means which were significant at the .05 level (Scheffé), are included.

SUB-SCALE	YEAR	GRADUATION CATEGORY			Oneway sig.of F	Significant comparisons Scheffé .05
		Dist'n	Commend	Ordin.		
	1	11.27	10.68	10.72	N/S	
DA	2	11.18	10.48	9.7	N/S	
	3	10.80	11.04	9.76	N/S	
	1	15.36	14.2	14.32		
SA	2	12.27	15.16	15.38	.02	D - O
	3	13.4	15.24	16.33	.06	
	1	11.18	12.16	11.14	N/S	
ST	2	12.64	12.2	11.16	N/S	
	3	11.1	13.0	11.28	.02	C - O
	1	8.18	8.08	10.08	.06	
DS	2	6.36	7.28	9.9	.005	D/O C/O
	3	7.31	7.78	9.83	.04	
	1	42.45	38.8	37.84		
MNG	2	43.0	36.44	36.68	.05	
	3	40.0	38.8	36.87		
	1	37.45	39.32	38.1		
REPRO	2	34.27	32.24	39.36	.15	
	3	34.1	38.1	39.63	.15	
	1	19.09	20.88	23.22	.11	
NONAC	2	16.54	20.72	23.5	.002	D - O
	3	20.6	23.04	25.39	.06	
	1	52.0	50.08	53.1		
SURC	2	46.0	50.08	55.74	.01	D - O
	3	46.2	51.72	57.28	.01	D - O

TABLE 6.12(b) Cell means for the approaches to studying and learning (Factor sub-scales and orientations), for Final Grade Academic categories with Year of Study. The significance of the F-ratios produced by one-way analysis of variance, and the comparisons between means which were significant at the .05 level (Scheffé), are included.

SUB-SCALE	YEAR	GRADUATION CATEGORY			Oneway Sig.of F	Significant comparisons Scheffé .05
		Dist'n	Commend	Ordin.		
Dis-dil	1	8.18	8.08	10.08	.06	
	2	6.36	7.28	9.9	.01	D/O C/O
	3	7.3	7.76	9.82	.04	
Open Appr.	1	18.36	14.32	15.18	.04	D - C
	2	18.0	14.16	15.68	.07	
	3	16.7	14.12	15.72	.14	
Supf.	1	7.82	7.8	9.48	.13	
	2	7.9	8.8	11.1	.00	D/O C/O
	3	8.8	9.2	10.67	.10	
Thor.	1	8.36	6.96	7.64	N/S	
	2	8.63	7.6	6.9	.18	
	3	6.4	6.88	6.2	N/S	
Init. Expl.	1	6.73	6.32	6.06	N/S	
	2	7.09	5.88	5.64	N/S	
	3	6.8	6.52	5.41	.11	
01 Sup'l disin	1	34.45	34.88	38.2	N/S	
	2	30.72	32.96	41.42	.000	D/O C/O
	3	36.2	37.32	43.74	.009	C - O
02 Expl-log'l	1	30.09	32.68	29.5	N/S	
	2	30.09	29.36	27.62	N/S	
	3	28.3	29.72	27.61	N/S	
04 Q'ing Advt.	1	28.36	21.56	24.78	.03	D - C
	2	27.73	22.88	26.58	.04	
	3	26.6	23.52	26.22	N/S	

TABLE 6.13 MANOVA for the dependent variable Non-academic Orientation, with the Final Grade Academic categories and the within-subjects factor Time (first, second, and third years). The cell means are given in TABLE 6.12a.

BETWEEN SUBJECTS EFFECTS
Tests of significance for T1 using Unique sums of squares

SOURCE OF VARIATION	SS	DF	MS	F	Sig.of F
Within cells	6024.54	78	77.24		
constant	77684.18	1	77684.18	1005.78	.000
FGACAD	829.27	2	414.64	5.37	.007

Tests involving TIME within-subjects effect
Mauchly sphericity test W = .99931
Chi-square approx. .05286 (df=2)
Significance .974

Greenhouse-Geisser epsilon = .99931
Huynh-Feldt epsilon = 1.00000
Lower-bound epsilon = .5

Effect FGACAD by TIME
(Multivariate tests of significance (S=2 M=-1/2 N=37,1/2))

Test name	Value	Approx F	Hypoth.DF	Error DF	Sig.of F
Pillais	.02312	.45613	4.0	156.0	.768
Hotellings	.02363	.44889	4.0	152.0	.773
Wilks	.97690	.45254	4.0	154.0	.770
Roys	.02220				

Effect TIME
(Multivariate tests of significance (S=1 M=0 N=37,1/2)

Test name	Value	Exact F	Hypoth.DF	Error DF	Sig.of F
Pillais	.10509	4.52106	2.0	77.0	.014
Hotellings	.11743	4.52106	2.0	77.0	.014
Wilks	.89491	4.52106	2.0	77.0	.014
Roys	.10509				

(note ... the F statistics are exact)

WITHIN SUBJECTS EFFECT TIME
(Averaged tests of significance for meas.1 using Unique sums of squares)

SOURCE OF VARIATION	SS	DF	MS	F	Sig.of F
Within cells	3292.78	156	21.11		
TIME	194.99	2	97.49	4.62	.011
FGACAD by TIME	37.96	4	9.49	.45	.773

Following the significant F's for the MANOVAS, one-way analyses of variance for each year by graduation category for each of the dependent variables were performed. The F-ratios are shown in the second to last column of TABLES 6.12a and 6.12b, and comparisons of means reaching significance are in the final column. The Scheffé procedure for assessing the significance of differences between means was adopted and the .05 level of significance accepted.

Results: The Entwistle scales. The between-subjects effect had significant F's on four of the Entwistle scales as follows:

Sub-scale	Significance of F
Disorganized Study	.005
Strategic Approach	.04
Non-academic Orient'n	.007
Surface-confused Orient'n	.015

The within-subjects factor (time), reached significance on one scale only, the Non-academic orientation to studying (F level of significance = .007). Thus the means for the Non-academic scale increased over the three years, and also the higher the graduation category, the smaller the means.

The within-subjects factor is likely to be influenced the most by bias due to homogeniety of variance. The SPSSx MANOVA programme calculates the Greenhouse-Geisser and the Huynh-Feldt epsilons so that a correction factor can be applied to the significant F. The correction factor was almost unity in the case of the Non-academic scale, and thus the null hypothesis with respect to the time effect can safely be rejected.

The Surface Approach to learning was the only sub-scale with a significant interaction effect of academic grade with time. The Distinction group means decreased over three years, while the Commendation and Ordinary group means increased.

Results: The Factor scales. Five of the Factor scales had significant F ratios for the main effect Final Grade Academic. These were as follows:

Sub-scale	Significance of F
F1. Disorganized and Dilatory	.005
F2. Open questioning Approach	.05
F8. Superficial Approach	.003
O1. Superficial and Disinterested Orientation	.001
O4. Questioning and Adventurous Orientation	.03

The within-subjects factor time was significant for two of the sub-scales - Thoroughness in Study, and the Superficial and Disinterested Orientation. This has been discussed earlier in the section dealing with trends.

There were no interaction effects of final grade with year of study.

Final-grade categories were related to only two sub-scales in the first year. These were the factor sub-scale Open approach to Learning, and the factor orientation Questioning and adventurous learning approach. In each case the group that finally graduated with distinction had a significantly higher mean score than the group that graduated with commendation. The Distinction group mean was also significantly higher than the Ordinary group mean if an ordinary t-test was applied, but did not reach significance with the more stringent Scheffé procedure.

In the second year several sub-scales differentiated the final grade categories. Surface-approach, Disorganized Study, Non-academic Orientation, Surface-confused Orientation, Disorganized and Dilatory Approach, Superficial Approach, and the Superficial-disinterested Orientation all distinguished the Distinction group from either or both of the other groups. There

seems no doubt, therefore, that students who had disorganized and/or who had a superficial approach to learning in the second year, did less well when it came to final academic success. The trends one would predict for the other sub-scales are apparent, although they do not reach significance levels. For example, the group finally graduating with distinction had consistently higher means for the Meaning Orientation than had the other groups.

In the final year the results are similar, although significant differences only appear for the Surface-confused and the Superficial-disinterested scales in the direction which might be predicted from previous research, and also for the Strategic Approach to learning where the Commendation group had significantly higher means than the Ordinary group, and higher, but not significantly different means than the Distinction group.

In summary, it is noted that the meaningful and reproducing approaches to learning, while almost always showing trends in the expected direction, seem to be less important in terms of academic success than the disorganized and superficial approaches. Meaningful and reproducing approaches to learning can both lead to success, as was pointed out in the literature review chapter. It is noted here, however, that students who achieved to the highest degree (by graduating with distinction), did tend to have higher scores on the Meaning Orientation and lower scores on the Reproducing Orientation for every year of the study, while for students who graduated in the lowest group, these trends were reversed.

(B) The Qualitative Data:

Three of the students who took part in the interviews were in the Distinction group with respect to Final Academic Grade. One of these students (Mary), was a subject selected as a case study, and some interesting findings emerged with respect to the

approaches to studying adopted by Mary. Early in the first year she had scored very highly on the Surface-confused orientation of the ASI, and she was thus selected to be a member of the 'Surface-confused' group. As time went on, however, it became apparent that Mary typified several other students in that group who have been described earlier as frustrated deep-learners.

The ASI profiles for Mary (see APPENDIX C.5.1) give very little indication of, and do not reflect the approaches to studying she described during the interviews. Mary put all her time and effort into the two subjects that she loved - Art and English. For these subjects she described her approach to assignments and essays in deep-level processing terms. Assignments related to other subjects were generally left to the last minute and were approached in a superficial way. She resented having to put the time into these other subjects which she usually described as being boring and non-relevant. These were obviously the subjects Mary had in mind when she was responding to the ASI.

When asked if there was a teaching style that she preferred because it suited her style of learning, she replied

> *"Yes...where I'm left to work at my own rate to produce a piece of work I enjoy doing. Where the lecturer is a guide rather than an instructor ... someone who works with me and is usually as excited about what I'm doing as I am."*

These are clearly not the words of a surface learner, which is how Mary appeared on the basis of her ASI profiles. Mary also expressed a strong dislike at being "...talked at - lectured at - and being told what to do and how to do it." The fact that Mary graduated with distinction shows that however unpleasant she found most of her learning experiences to be, she was able to discipline herself somewhat.

Discipline and organization were the main features of the other two students from the interview group who graduated with distinction. These students described their approaches to

studying in strong Strategic terms (which were also reflected in their ASI scores). They were extremely well organized and systematic. The cue-seeking activities of one of them (subject 39) has already been described (p.139).

CHAPTER SEVEN

RESULTS: LEARNER MOTIVATION

Research questions 4 and 5 provided the focus for the research with respect to motivation (see FIGURE 5.1, Chapter Five):

Question 4: What relationship, if any, will there be between learning strategies and student motivation?

Question 5: Which of the several motivational variables impacting on student performance will be the most salient?

QUESTION 4. What relationship, if any, will there be between learning strategies and student motivation?

Quantitative data from both phases of the research were pertinent to the answering of this question. In addition, the qualitative data from Phase 1 provided useful insights into several aspects of student motivation.

(A) The Quantitative Data.

Some idea of the relationship between motivational variables and learning strategies was gained from studies which correlated the Motivation sub-scales of the ASI with the Approaches to Studying and Learning sub-scales. Anxiety scores from the State-trait Anxiety Inventory (STAI), and Commitment to Teaching scores from the Expressed Vocational Commitment Scale (EVCS) were

also correlated with the Approaches to Studying sub-scales for Year 1 of the Phase 1 research design. The sub-scales and orientations related to learning strategies were those outlined in Chapter Six. Categorizing a scale as motivational or as an approach to learning was usually fairly straight forward, especially with the Entwistle sub-scales, but there were one or two grey areas with the Factor sub-scales: for example, Factor Scale 6, Safety-first, could logically be accepted as an approach to learning but was categorized as a motivational variable because inspection of the items revealed that there was an element of anxiety or fear (the student is afraid to take risks or to speak out in case she or he is made to look foolish). The motivation sub-scales and orientations, then, were as follows:

THE MOTIVATION SCALES OF THE ASI.

1. Factor scales

F4. Disgruntled	The student has vocational doubts, and a passive, closed approach to learning.
F5. Enthusiastic	The student has an enthusiasm for learning for its own sake.
F6. Safety-first	The learner adopts a cautious passive approach, mainly because of fear of failing.
F7. Need for Success	The student has a strong competitive drive.
F12. Vocational impetus	The goal of getting a job is the over-riding motivation (not to be confused with commitment to teaching).
03. Achievement-structured Orientation	The learner has a strong need to do well which is associated with a preference for a highly structured learning environment.
05. Non-confident Orientation	The learner adopts a safe, non risk approach associated with lack of confidence in the study strategy adopted.

2. The Entwistle Scales

Intrinsic motivation (IM)	Interest in learning for learning's sake.
Extrinsic motivation (EM)	Interest in courses for the qualifications they offer.
Achievement motivation (AM)	Competitive and confident.
Fear of Failure (FF)	Pessimism and anxiety about academic success.
Negative Attitudes (NA)	Lack of interest and application.
Achievement Orientation (IM+AM+ST)	A strong desire to succeed and a systematic approach to learning.

TABLE 7.1 and TABLE 7.2 present the Pearson product-moment correlation coefficients ($p < .01$) for the motivational factors with the approaches to studying and learning factors, for first, second and third year students in Phases 1 and 2 of the overall research design. It should be noted that two of the Factor scale pairings contained a common item (Superficial Approach to Studying and the Disgruntled scales have one item in common, and, Open Approach to Studying and Need for Success likewise have one common item), and some of the orientations in both sets of scales were correlated with sub-scales which contributed to these orientations (for example, the Entwistle orientation Reproducing comprises the sub-scales SA, SB, IP and FF, and Fear of Failure or FF is one of the motivation sub-scales with which the Reproducing Orientation was correlated). The correlation coefficients in these cells are therefore inflated and these are indicated by **bold** type in the tables.

Results from the correlation studies. The results contained little that was surprising. Almost all the significant correlations were with the scales, and in the direction indicated by previous research utilizing the ASI (Watkins, 1982a; Entwistle and Ramsden, 1983). That is, a deep approach to learning was associated with both intrinsic and achievement motivation. A surface approach to learning was associated with fear of failing, and to a lesser extent with extrinsic motivation and negative attitudes to learning.

TABLE 7.1 Multiple correlation coefficients for Motivational variables with Approaches to Studying and learning (FACTOR SCALES) for YEARS 1-3. L = Longitudinal phase (n = 86). C = cross-sectional phase (n = 136, 130, 102). Coefficients in BOLD type indicate factors that have one item in common, or orientations which have a sub-scale in as a component. Only the coefficients with p < .01 are tabled.

APPROACHES TO STUDYING	YR	MOTIVATIONAL VARIABLES													
		Disgruntled		Enthusiastic		Safety-first		N. Success		Voc'l impulse		ACH.-STRUCT.		NON-CONFIDENT	
		L	C	L	C	L	C	L	C	L	C	L	C	L	C
Disorgan'd -dilatory	1	.30	.32		-.24	.20	.21							.22	.37
	2	.24	.22	-.25		.27								.40	.35
	3	.38					.22	-.24				-.32			.46
Superfic'l	1	.32	.42		-.38	.23								.34	.38
	2	.32	.42				.25							.42	.51
	3	.30	.37		-.30										.45
Open Approach	1				.32		-.30	-.35	-.34			-.88	-.90		-.28
	2				.30	-.26	-.33	-.46	-.25			-.92	-.87	-.32	-.35
	3							-.35	-.30			-.86	-.88		-.22
Thorough--ness	1		-.31	.26	.30	-.30	-.31							-.74	-.78
	2		-.47	.30	.28	-.28	-.24							-.69	-.74
	3	-.34	-.34		.40		-.30		-.31				-.27	-.65	-.77
Initial Explorat'y	1		-.26	.23	.35					.32				-.28	-.46
	2		-.25	.27				-.32				-.43		-.40	-.37
	3														
SUPERFIC'L DISINT'D	1	.65	.68	-.49	-.59	.29	.29							.50	.63
	2	.58	.67	-.47	-.44	.34	.23							.60	.64
	3	.72	.61	-.49	-.49		.26	-.34				-.27		.38	.68
EXPLORE-LOGICAL	1		-.27							-.56	-.25				
	2		-.30					-.28		-.33	-.27				-.27
	3	-.32								-.37	-.26	.24			
QUEST'ING ADVENT'S.	1						-.33	-.32	-.30			-.73	-.71		-.26
	2				.20	-.25	-.38	-.28	-.30			-.67	-.73		-.22
	3					-.29	-.30	-.35	-.26			-.76	-.70	-.25	

TABLE 7.2 Multiple correlation coefficients for Motivational variables with Approaches to Studying and learning (ENTWISTLE SCALES) for YEARS 1-3. L = Longitudinal phase (n = 86). C = cross-sectional phase (n = 136, 130, 102). Coefficients in BOLD type indicate where a sub-scale is a component of a particular orientation. Only the coefficients with p < .01 are tabled.

APPROACHES TO STUDYING	YR	MOTIVATIONAL VARIABLES											
		Intrinsic M.		Extrinsic M.		Achievement M		Fear of Fail.		Negative Atts		ACHIEVEMENT O	
		L	C	L	C	L	C	L	C	L	C	L	C
Deep Approach	1		.46				.21						.50
	2	.27	.30	-.25								.35	.31
	3		.28									.36	
Surface Approach	1					.23		.29	.38		.26		
	2		-.20	.24	.33		.25	.25	.39		.40		
	3	-.25	-.24		.21		.39		.40				
Disorgan'd Study	1		-.24						.33	.34	.22	-.32	-.23
	2	-.24	-.20					.35	.19			-.29	-.20
	3								.44	.33		-.27	
Strategic Approach	1		.40									.56	.68
	2						.27					.47	.65
	3					.22	.24					.57	.57
MEANING	1	.36	.50				.20					.30	.52
	2	.37	.37				.20					.33	.43
	3	.50	.40										
REPROD'ING	1	-.24	-.24					.68	.75		.22		
	2	-.26			.40			.69	.71		.37		
	3	-.26	-.30				.38	.60	.73		.21		
NON--ACADEMIC	1	-.37	-.46						.30	.71	.59	-.44	-.42
	2	-.43	-.37		.22			.33	.37	.66	.64	-.40	-.32
	3	-.45	-.35			.29			.39	.71	.61	-.40	
SURFACE-CONFUSED	1	-.27	-.29					.56	.67	.50	.54	-.26	-.22
	2	-.27	-.20		.35			.69	.64	.51	.61	-.22	
	3	-.30	-.27				.26	.49	.70	.57	.45		

An interesting finding from the Factor-scale correlations, was that Need for Success did not correlate positively with any of the approaches to studying and learning factors. The significant negative correlation between the Need for Success factor and the Questioning-adventurous Orientation might be explained by the observation that a strong desire to succeed is unlikely to be positively associated with an approach to studying that involves the questioning of assumptions and the taking of risks. The lack of any positive correlations for this factor was possibly also a reflection of the fact (which emerged from the interviews) that students generally felt that it was 'not the thing' to be seen as being in any way competitive with respect to their peers, except perhaps in sport.

Vocational-impetus presented only one correlation that was significant (except for the negative correlation with the Exploratory - logical factor of which it was a component), and that was with the Initial-exploratory sub-scale for first year students in the longitudinal study. This is not easy to explain, but it may reflect a particular concern at that time. In 1983 there was a surplus of teachers, and permanent teaching positions were extremely difficult to obtain. Then in 1984, and for several years thereafter, intakes into teachers colleges were severely cut, and prospects of employment for students still in training seemed suddenly brighter. Thus it could be that students in 1983, anxious about job prospects, were reluctant to adopt an approach to learning that was in any way risky.

Using both sets of scales in the Phase 2 cross-sectional design produced considerably more correlations that were significant than did the longitudinal phase with both sets of scales. This was possibly because of the relatively heterogeneous nature of the cross-sectional populations, and also perhaps because of the larger n's.

Commitment to teaching. The Expressed Vocational Commitment Scale (EVCS), was administered to all students at the beginning

of the first year. Correlations with the approaches to studying sub-scales of the ASI for Year 1 revealed only one significant relationship. The EVCS total score correlated negatively with the Non-academic orientation ($r = -.21$, $p < .05$). The most significant finding was that the EVCS total score correlated positively with another motivational sub-scale Enthusiasm for Study in every year. The coefficients and probabilities were as follows:

Year 1. corr. = .30 ($p < .005$)
Year 2. corr. = .22 ($p < .04$)
Year 3. corr. = .26 ($p < .02$)

This was of interest because it was the only significant correlation other than the negative relationship with Non-academic Orientation in Year 1 and it was a consistent relationship. It appeared that an enthusiasm for teaching went hand in hand with an enthusiasm for learning.

Quantitative data from the Interview group. Students categorized as Surface-confused on the basis of their scores on that scale of the ASI in their first year at college, were considerably more anxious (in terms of Fear of Failure) than the control group. When submitted to a t-test, means of 8.75 and 6.85 respectively were significantly different at the .05 level of probability (see TABLE 7.3). It needs to be kept in mind, however, that the Fear of Failure sub-scale is one of the six sub-scales that combine to produce the Surface-confused orientation. Nevertheless, the State-trait Anxiety Inventory scores for the two groups were also considerably different. The means of 43.0 and 37.25 just failed to reach significance at the .05 level ($p < .07$). The groups were not significantly different on any of the other motivational scales of the ASI in the first year (see TABLE 7.3).

In the second year the Random group were significantly

higher in Achievement motivation ($p < .01$), and in the third year there were no significant differences between the groups with respect to these scales. (As was mentioned earlier, in the second and third years the Surface-confused group was not really any more 'surface-confused ' than the other group.)

TABLE 7.3 Significance of the difference between means on the motivation sub-scales of the ASI for the two interview groups (Surface-confused and Random) for the first year (t-test two-tailed).

Motivation Scale	SUR-CON	RANDOM	(p)
Intrinsic motivation	6.58	6.55	n/s
Extrinsic motivation	4.75	5.8	n/s
Achievement motivation	9.33	9.0	n/s
Fear of Failure	8.75	6.85	<.05
Negative attitudes	7.41	5.65	n/s
ACHIEVEMENT ORIENT'N	26.0	27.0	n/s

There was little point in comparing the two groups on the Factor-scales because of the commonality of items (the 25 items which contributed to the Surface-confused orientation were scattered throughout many of the Factor scales).

Commitment to Teaching. The S-(self-report) scale of the EVCS was given to each interviewee at the conclusion of each interview, thus monitoring students' feelings with respect to teaching at five points throughout the three years. TABLE 7.4 shows that the trend was towards an increase in commitment over that period of time. To simplify the table, only three points in time are indicated. The first is the beginning of Year 1 (BY1); the second mid-way through the second year (MY2); and the third, the end of the third year (EY3). Only the first three categories are reported, these being Very Highly, Highly, and Moderately Committed.

The small number of students who were only moderately committed to teaching was relatively constant from year to year. The increase in the highest level came mostly from the Highly Committed group. The amount of change in individuals was

TABLE 7.4 Percentage of students from the Surface-confused and Random groups at each of three levels of commitment as measured by the S-scale of the EVCS, for the beginning of Year 1 (BY1); midway through the second year (MY2); and the end of Year 3 (EY3).

	COMMITMENT LEVEL								
	Very high			high			moderate		
Period	BY1	MY2	EY3	BY1	MY2	EY3	BY1	MY2	EY3
Sur-conf'd	17	50	42	66	33	28	17	17	30
Random	16	22	47	63	50	30	21	28	15
Combined	16.5	34	45	64	45	29	19	22.5	23

relatively slight, usually no more than one point or half a point on the five-point scale, from one interview situation to the next. The few exceptions to this rule were the result invariably of some negative experience in the school situation which had shattered student confidence and made them seriously consider (if even for a short while) whether teaching really was for them.

(B) The Qualitative Data.

Many of the questions throughout the series of interviews were aimed at monitoring and describing student motivation (See TABLE 3.4 in Chapter Three). A full analysis and summary of Interviews One and Five appear in APPENDIX B. Each summary treats motivation as a separate issue, and the reader is thus directed to that source for a fuller account of student motivation than is presented in this chapter.

Motivational variables which were systematically investigated by means of the interview procedures were:

Anxiety
Need-achievement
Academic goals
Commitment to Teaching
Interest
Stress

1. Anxiety.

State-anxiety and Trait-anxiety were readily distinguishable in the interview subjects. State-anxiety referred to anxiety in specific situations such as examinations, while Trait-anxiety referred to general anxiety such as worrying about the future.

In the total interview sample (n=32) 87.5 percent indicated moderate to high levels of anxiety in exam situations, but only 46.9 percent were anxious about the future. The Surface-confused group were more extreme in their expressions of anxiety. 11 of the 12 students in the group (91.7 percent) said they were anxious in exam situations, but only 25 percent worried about the future. When students were asked to talk about the kinds of things they worried about, those in the Surface-confused group worried mainly about succeeding in college (this is in line with their relatively high scores on the Fear of Failure sub-scale of the ASI). The other students tended to worry more about job prospects and about getting a fourth year studentship. Thus the Surface-confused students not only were more anxious, but they were anxious about different things from the other students.

2. Need-achievement.

The questions designed to investigate need-achievement did not appear to work very well. The first question, which asked students whether they had any ambition to graduate with distinction, failed because of the general ethos (in the college specifically, but perhaps general throughout the country), that wanting to achieve well academically is something not to be admitted. Only one student said that she would like to be in the 'top ten' of her year academically (which she was). Two or three expressed mild interest, but appeared embarrassed about it.

Another question explored the achievement issue indirectly. By probing student attitudes towards giving primary school children homework, it was assumed that they might project their real feelings about the need to achieve well. This question did not work either, because all of the students were quite in favour

of giving even very young children homework, the most common reason given being habit formation.

A third question asked students what was most important for them personally: getting good grades, or all-round personal development (defined as engaging in a wide range of activities and interests). Answers to this question were quite interesting. Nobody in the Surface-confused group said that getting good grades was the more important for them (but two people did say that they thought both were equally important). The general impression was of an almost knee-jerk response, that one must not be seen to be academically orientated in any way. Two students in that group, however, did admit that their actions did not match their words. In fact they had narrowed their range of activities since entering college to exclude cultural and sporting activities because it was important for them to cope academically. Students in the Random group tended to be a little more realistic, and some admitted that getting good grades was more important for them because career opportunities might be enhanced, particularly if they were able as a result of good grades to get a fourth year studentship at university in order to complete the Bachelor of Education degree. Many of these students rationalised this position by adding that they were well-rounded people anyway.

The main finding from the interviews with respect to need-achievement, then, was that academic excellence was not generally admired and that, while many students might have aspired to achieve well, they did not like to admit it publicly.

3. Academic goals.

The academic goal in question was principally the attainment of a fourth year studentship in order to complete the Bachelor of Education degree. Students realized that entering the teaching service with a complete degree gave them an advantage on the teachers salary scale, with a possible advantage also in winning a permanent teaching position. The criteria which applied to the

granting of an extended fourth year studentship were having a good academic record (no failed subjects), and a good teaching practice record.

While several students had the goal of a degree in mind from the beginning, and persisted with it throughout their time at college, the students in the Surface-confused group did not aspire to it at all in the first year. In subsequent years, about 50 percent of them did have the fourth year studentship as a goal. It seemed that once they had achieved some academic success, the goal became realistic for them.

At the end of the third year over 90 percent of the students interviewed expressed a wish to undertake further study after leaving college, and 61 percent hoped to complete their Bachelor of Education degree on a full-time basis (the fourth studentship year already mentioned). TABLE 7.5 shows the number of students in each group who wished to complete their degree.

TABLE 7.5 Number of students in the Surface-confused and Random groups (at the end of the third year) who wished to complete their degree by either full-time or part-time study.

Means of study	Full-time	Part-time	total
Surface-confused	6	4	10
Random	13	5	18
Total	19	9	28

This finding appears to be in marked contrast to that reported by Watkins and Hattie (1983) which suggested that many students at the Australian National University wanted no part of further study after their three years. It must be remembered, however, that there were strong incentives for this New Zealand sample (both in terms of starting salary and prestige) for them to complete a degree. It is important to note also that the

Australian students had almost completed their first degree. The pressure on Hamilton Teachers College students to complete a degree is well illustrated by the comments made by a male student who had consistently maintained an anti-academic pose throughout the three years:

> *"I dislike study, and will avoid it as much as possible, only doing as much as is required and will not wish to study further. You may be wondering - 'Why do an S4 year then?' I don't really know - its a qualification, but I'd rather be away from this place. My parents and family feel its a good idea, and although I hate to say it - they are perhaps pushing me to do it more than I really want to. I know its a useful qualification though."* 76 M. (R)

These sentiments did not appear to be general, but it was noted that only four students out of the 31 (one interview subject dropped out during the second year) said that they would like to go on and do a Masters degree.

It should be noted that only one of the approaches to studying scales of the ASI was strongly related to the academic goal of gaining a degree. That was the Surface-confused orientation in the third year. Of the students who comprised the ten highest scores for this scale in the third year, only one student went on to complete a degree, and that was the student who was quoted above!

Factor-scale 8 - (Superficial Approach) also seemed to be negatively related to the academic goal motive. Only three out of the ten highest scorers on this scale went on to complete their degree.

In general, it can be said that while having a goal to continue studying after leaving college did provide an impetus to work, it did not seem to have a strong effect on students' approaches to studying.

4. Interest.

(i) and Attribution of effort. Two questions in Interview One asked students whether they put most time and effort into subjects that interested them, or into subjects that they found difficult or had the greatest workloads. One of these questions related to when the students were at high school, and the other to their present situation in college. TABLE 7.6 presents the results for both groups.

TABLE 7.6 Percentage of students in the Surface-confused and Random groups who attributed effort to either interest (or enjoyment) of the subject, or to difficulty with the subject and or workload at high school and at college.

	High school		College	
GROUP	interest	diff'lty	interest	diff'ty
Surf-conf'd	75	8	83	8
Random	59	29	35	65

Chi-square tests revealed that the groups differed significantly with respect to their attributions of effort when at college ($\chi^2 = 7.03$ $p < .01$). The rows in the above table do not total to 100 percent because some responses fell outside these categories - one student, for example, said quite cheerfully that he did not put much time and effort into any subject!

The main finding with respect to interest as a motivational variable was that the Surface-confused group tended to be inflexible with their learning modes when at college. They were reluctant to put time and effort into courses that did not interest them. Students in the Random group were more flexible and pragmatic however, and tended to put most effort into subjects that were having difficulty with, or they simply responded to the pressures of work-load. The finding with respect to the Surface-confused group was rather curious and not what one would expect. Given their relatively high levels of

fear of failure, they might be expected to put most effort into subjects they were finding difficult - but they did the opposite. Perhaps that is a function of their being confused!

(ii) and specificity of interest as a motivator. Throughout the interviews it was obvious that interest was generally specific to one or two subjects, rather than an across the board interest in all the subjects related to teaching. Interest in a subject usually, but not always, resulted in a deep-level approach being adopted for that subject. In a few cases this did not happen and a superficial approach was taken. For example, a student who had a deep interest in history said:

> *"I'm fairly good at history, so I don't need to do much work for the history test. With the heavy work-load that I have at the moment I'll put the time into the Issues in Education essay. I could pass history without doing any work, but I will do a little bit." 46. M. (R).*

In the final interview, students were asked to list the factors that had most influence on their present approach to studying. Over 50 percent of the factors listed were motivational factors, and of these, in order of frequency were: interest in the subject or topic; the need to do well; fear of failing; and a general feeling of well-being.

Another question asked students to list factors that had raised (and lowered) their motivation over the three years, and none of the students listed interest as a factor.

In conclusion, interest as a motivational variable was generally specific to one or two subjects for any individual. For the students in the Surface-confused group, interest was the key to their approach to learning and which was applied in a fairly rigid manner. Interest was not such a dominant factor in influencing the approaches to learning of the other students, especially in the first year.

5. Commitment to teaching.

At each interview students were asked to rate their commitment to teaching on the S-scale of the EVCS as has been described in the section above dealing with the quantitative data. Where commitment had changed, students were asked to give reasons. The experiences students had on their teaching practice were the single greatest factor in changing commitment, as might have been expected. Enthusiasm to teach could 'take a dive' after some bad experience with teachers or children.

6. Stress.

In the first interview, students were asked whether they had experienced any crisis since they had entered college. In succeeding interviews, the period in question was from the previous interview.

There were wide differences in the things students considered to be of crisis proportions, ranging from fairly trivial things like "My transister radio was stolen." to situations that were stressful in the extreme. Interviews at the end of the first year revealed the following crisis situations (in order of frequency of mention) which were obviously stressful in that students claimed their work had been, or was being, adversly affected:

The death of a family member or close friend.	(6)
Environmental change	(3)
Accident or sickness	(3)
A broken relationship	(2)
Vocational doubts	(2)
Family problems (e.g. Parents separating or divorcing)	(2)
Difficulty with college work	(1)
Over-commitment	(1)

Four students mentioned having financial problems, but saw these as fairly minor since they were not affecting their work adversely at that stage.

The death of a close friend or relative was not only the most frequently mentioned cause of stress (20 percent of the total interview sample), but was also the most debilitating in terms of effect on studying and learning: students were often grieving, were unable to concentrate on their work, had loss of appetite, and were not sleeping well. Sometimes they faced added responsibilities, as was reported by one male student.

> *"Just when I started college my father died. I didn't know anybody I could really talk to. Another girl in my T-group - who you are also going to interview - (laughs) ... she's been really good to me. She understands, because of my culture - well she's Samoan actually, but she relates well and understands what I've gone through.*
> *My mum depends on me now. Her pension isn't very high. I've got two part-time jobs. I do a milk run and a paper run. Its quite tough really though. I don't know what I'd do without that special person, that close friendship... that you can go to with a problem." 90, M. (S).*

Environmental change could also be quite debilitating, and the effect seemed to be worsened by the fact that few people were sympathetic or appreciated how the sufferer felt. One young woman was quite distressed as she described the shock of changing from living in a close knit family situation in a small coastal town to living in the college halls of residence:

> *"In the first term, home-sickness. I really had it bad. I was quite disoriented you know - at home we have a coastline and you always know where you are, but here! ... I just couldn't get my bearings for a long time. Then there's getting used to the Halls - no parents! You come home and there's no-one to say "How did things go today?" That was awful. I was really worried about my work too 'cos I couldn't settle. Now I feel - well I'll do my best, and if that isn't good enough - too bad!"*
> *38, F. (S)*

A higher proportion of students in the Surface-confused group said that they had experienced, or were experiencing stress than did students in the Random group at the first interview (67 percent compared with 50 percent). One <u>third</u> of the former group

were trying to cope with death of a close friend or family member compared to one tenth of the Random group. This pattern, though not so dramatic, also applied to the other major stress categories (accident and sickness, parents separating).

There was no doubt that stress was a major factor influencing student approaches to learning. The general effect appeared to be most traumatic in the first year when students were not so self-reliant as they became later, and had not yet built up a close network of friends who could give support. As the years progressed, however, other types of stress factors became more common. Moving from the Halls of Residence to flatting - a common second year phenomenon - was, in a few cases, a very stressful experience. One young woman found herself a virtual servant to a group of dominant males who expected her to do all the cooking, cleaning, washing and shopping. Others had little experience in budgeting, and frequently had insufficient to eat, or existed on a poor diet. Some had to cope with noisy and inconsiderate flatmates. Finance became more of a stress factor as time went on, and many students had to find part-time work, which often had a very direct bearing on how they went about studying.

Of all the motivational variables considered in this study, stress, with accompanying anxiety, seemed to have the greatest effect on student approaches to learning. It seems reasonable to suppose that many of the students who had been categorized as 'surface-confused', were in that category because stress was affecting their ability to work. General lassitude, being disorganized, and unable to concentrate are all symptoms of stress, and are also descriptors of the Surface-confused Orientation. The fact that so many of the students who scored very highly on the Surface-confused Orientation of the ASI in Year 1 did not do so in the other years might easily be explained in terms of the relief from high levels of stress (the stress associated with death, sickness, adapting to strange environments is usually temporary).

QUESTION 5. Which of the several motivational variables impacting on student performance will be the most salient?

The Quantitative data relevant to this question derived from the Phase 1 longitudinal research design because no indicators of performance were collected from the cross-sectional population. Qualitative data come from the case studies.

The Quantitative Data:

Two methods of relating the motivational sub-scales of the ASI to performance were adopted:

1. Correlational. Correlations between sub-scales and performance as measured by end of year grades. The end of year grades were the combined grades for education courses as was described in Chapter Six (pp.155-156).

2. Multiple Analyses of Variance (MANOVAS). These were performed to determine the relationship between motivation and the diploma graduation categories Distinction, Commendation and Ordinary (see Chapter Six, p.156). This procedure was also appropriate when the indicator of performance was the Final Grade for Teaching Practice (FGTP). This final grade was categorized into the three groups Distinction, Commendation, and Ordinary in the same manner as the Final Grade Academic.

Correlation results. TABLE 7.7 presents the correlation matrix for the motivation scales with academic grade for each year. It can be seen that none of the coefficients was significantly related to academic success in the first year. In

TABLE 7.7 Pearson correlation coefficients for the motivation sub-scales of the ASI with the final grades (academic) at the end of each year. Coefficients for the motivation variables Commitment to Teaching (EVCS total score), and Anxiety (STAI total score) are produced for Year 1. Coefficients >.20 in bold type.

Motivation sub-scale	ACADEMIC GRADE					
	Year 1		Year 2		Year 3	
	r.	p.	r.	p.	r.	p.
Intrinsic mot.	.02	-	.02	-	.13	-
Extrinsic mot.	.11	-	.08	-	-.04	-
Fear of Failing	.01	-	.11	-	.15	-
Achievement M.	.03	-	.20	<.06	.12	-
Negative Atts.	.07	-	-.15	-	-.29	<.01
ACHIEVE ORIENT'N	.08	-	.24	<.03	.20	<.05
Disgruntled	.11	-	-.28	<.01	-.32	<.00
Enthusiastic	.04	-	.02	-	-.06	-
Safety first	-.15	-	.11	-	-.10	-
Need for Success	-.04	-	.14	-	.20	<.04
Vocational Imp.	-.06	-	.08	-	.04	-
ACH.-STRUCT.	-.16	-	.13	-	.08	-
NON-CONFIDENT	-.04	-	.06	-	-.14	-
Commit to Tchg.	-.04	-				
Anxiety	.05	-				

Year 2 the Achievement Motivation sub-scale, and the Achievement Orientation were both correlated moderately with academic success. There was a negative relationship between the factor scale Disgruntled and academic performance (students who were disgruntled tended to do less well than students who were not disgruntled). The situation was similar in Year 3 and, in

addition, Negative Attitudes correlated negatively with academic performance, while Need for Success had a moderate positive correlation. It is interesting to note that Intrinsic Motivation and Extrinsic Motivation appeared not to be related to academic performance, and neither were the Commitment to teaching and Anxiety scores.

MANOVA results. The main point of interest in the analyses of variance tests was the between-groups main effect, which indicated whether or not there was a relationship between a motivational sub-scale and the final grade academic (or teaching practice) at the end of training. Where a significant F resulted, one-way analyses was performed in order to determine which of the comparisons between groups were significant. From these analyses it appeared that only three of the motivational variables of the ASI were related to academic performance as measured by the final grade category. These were the Factor scales Disgruntled, and Achievement-structured orientation, and the Entwistle scale Achievement orientation. TABLE 7.8 presents the details of these analyses.

TABLE 7.8 Cell means and group comparisons (one-way analysis of variance) for the motivation variables by year and final grade academic, following significant F's from MANOVAS.

Subscale	O'all F	Year	GRADUATION CATEGORY Dist.	Comm.	Ordin.	Oneway sig. of F	Compar'n p < .05 (Scheffe)
Disgrunt	.01	1	6.73	5.96	6.26		
		2	5.18	5.24	7.58	.001	C-O D-O
		3	6.20	7.48	9.30	.001	C-O D-O
ACH-STR	.03	1	17.55	23.52	21.98	.03	C-D
		2	17.27	23.24	20.42	.03	C-D
		3	19.20	22.96	19.70	.06	
ACHIEVE	.02	1	26.45	28.68	26.88		
		2	28.00	29.20	25.84	.02	C-O
		3	26.00	29.32	25.35	.04	C-O

Inspection of the cell means in TABLE 7.8 reveals that students in the Distinction and Commendation groups were significantly less disgruntled in Years 2 and 3 than were the students in the Ordinary category.

The achievement scales both show similar patterns - a trend for the Commendation group to have higher achievement scores than the other two groups. The effect is illustrated graphically in FIGURE 7.1.

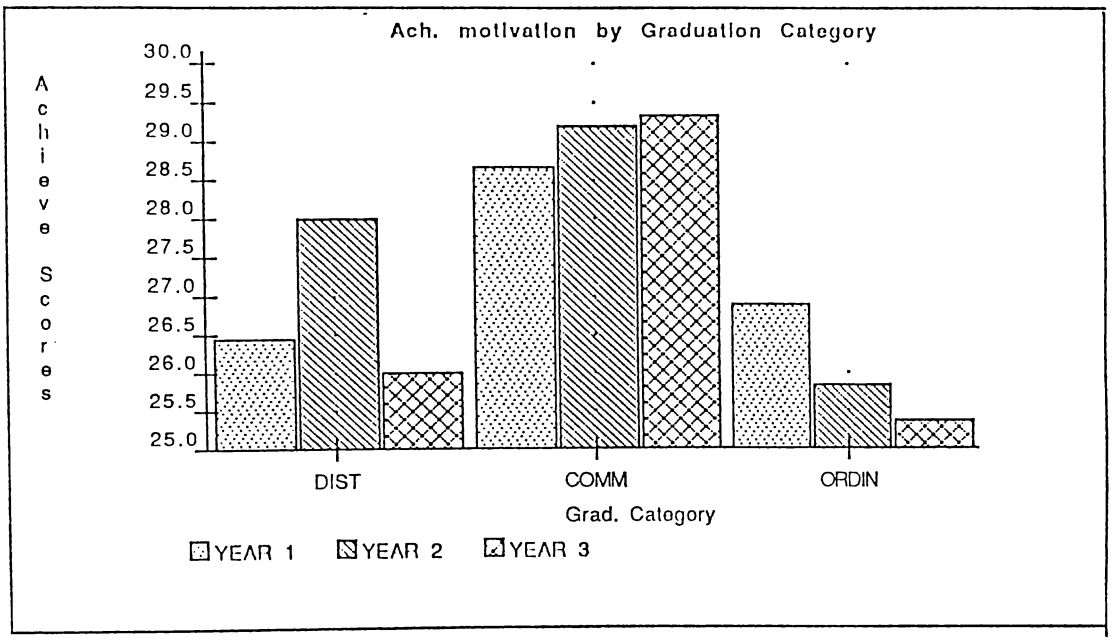

FIGURE 7.1 Levels of achievement motivation for each year as measured by the Achievement Orientation sub-scale of the ASI for Final Grade (academic) categories: Distinction, Commendation and Ordinary.

Motivation and Teaching Practice. When MANOVAS were carried out for the motivation sub-scales with the three categories of Teaching Practice Final Grade by Year, it was something of a surprise to find that none of the analyses produced significant F's for the between-groups main effect. From this it can be concluded that motivation as measured by the ASI sub-scales was not related to student performance in schools. Only two scales had F's significant at below the .20 level of probability. These

were the achievement orientations described above, and indeed a similar inverted U trend was apparent i.e. the Commendation group had higher achievement scores than had the other two groups.

Motivational Trends. Although it was not included as a research question concerning motivation, the trend across years appeared as a very significant aspect. While few of the sub-scales analysed had significant between-groups effects, most of them had significant F-ratios for the within-subjects factor time. This was the case in both the Single-factor analyses of variance for sub-scale with year, and the two-factor analyses of sub-scale by final grade category with year. TABLE 7.9 presents the scale means for each year and the significance of the F-ratio.

TABLE 7.9 Significance of F from repeated measures analysis of variance by Year (longitudinal phase). T-tests for related samples test the significance of comparisons of pairs of means ($p < .05$).

Sub-scale	Lv. of sig.of F	MEANS			Comparisons (p<.05)		
		Year 1	Year 2	Year 3	Y1-Y2	Y1-Y3	Y2-Y3
Ext.mot'n	.002	5.10	5.35	6.37		*	*
Int.mot'n	.145	6.73	7.28	6.36			
Ach.mot'n	.004	9.06	8.28	8.23	*	*	
Neg.Att.	.001	5.61	5.68	7.62		*	*
F.of Fail	.85	6.37	6.26	6.44			
Disgr'tld	.000	6.30	6.62	8.36		*	*
Enthus.	.06	3.80	4.39	3.96			
Saf-first	.002	9.52	9.52	8.39		*	*
N-success	.001	9.37	8.54	7.99	*	*	
Voc.imp.	.017	2.75	3.83	3.49	*	*	
ACH-STR.	.05	22.20	21.11	20.64		*	
NON-CONF.	.93	22.79	23.01	22.83			

These results suggest that over the three years at college, the students in Phase 1 of the present research increased their levels of having negative attitudes towards studying, being disgruntled, being motivated extrinsically and being motivated primarily by the need to get a job. On the other hand, achievement motivation, a safety-first approach to learning, and the need for success decreased over the same time period.

These findings generally complement the trends found with respect to the approaches to studying and learning (Chapter Six), e.g. the increase in negative attitudes and feelings of being disgruntled complement the increases in surface-learning, superficial approach, and the disorganized and disinterested approach. They are also in line with the findings of Watkins and Hattie with respect to the trends in Australian students (Watkins and Hattie, 1983).

The cross-sectional results of the Phase 2 research design, however, do not mirror the above trends. Only three of the motivational sub-scales produced F's that were significant from MANOVA tests. These were Enthusiasm for Study, where there was an increase in the means from Years 1 and 2 to Year 3; and Need for Success, where there was a decrease in the means across years (this scale did follow the same trend as was found in the longitudinal phase); and means for the factor orientation Achievement-structured also decreased across years. Analyses of covariance with the factor age as covariate revealed that the differences in means from year to year was principally due to age. TABLE 7.10 gives the means on each of these sub-scales for the six age categories, and the significance of the F-ratio from the analysis of covariance.

From TABLE 7.10 it can be seen that older students were more enthusiastic about study, had less need for success, and were less inclined to favour a high level of structure because of a strong need to achieve well. Again these results complement the findings of Chapter Six with respect to the approaches to studying adopted by older students.

TABLE 7.10 Means for each age category in the cross-sectional population for the motivation sub-scales Enthusiasm for study, Need for Success, and Achievement-structured. The significance of the F-ratios from the analyses of covariance are presented for each sub-scale.

Motivation Sub-scale	Sig. of F	AGE					
		17	18	19	20	21-24	25+
		n=25	n=97	n=77	n=77	n=55	n=37
Enthus.for sty.	.000	3.44	4.10	3.95	4.71	4.11	5.76
Need for Succ.	.007	8.44	8.73	8.07	7.66	7.86	6.92
ACHIEVE-STR.	.000	21.40	20.96	19.48	18.57	18.83	16.35

(B) The Qualitative Data:

It was almost impossible to find anything consistent about the motivational patterns of the three students in the interview sample who graduated with distinction. One might have expected to find that they were all strongly motivated to teach, but this was not so. They might also have been expected to be high achievers, or be particularly enthusiastic about studying, but this was not the case either. Only one of the three went on to do a fourth year at university. Of the other two, one wanted to travel overseas and wanted to earn some money quickly in order to be able to do this; the other had had enough of studying and just couldn't wait to get into her own classroom.

In Interview Five, when discussing the factors that raised or lowered their motivation over the three years, these same three students all mentioned being motivated by practical, relevant experiences, and getting favourable feedback from lecturers. Factors that lowered their motivation were the reverse of these: courses that were too theoretical or non-relevant, and unfair or negative feedback from teaching staff (these comments, it should be noted, were fairly common across the whole interview group).

Some common factors were evident in the motivational patterns of students who did not achieve well. The ASI profiles and interview comments from the six students who were lowest in the Final Grade Academic rankings revealed a strong tendency to express negative attitudes, and to be disgruntled and dissatisfied about their college experiences. Four of them in particular had rather low opinions about themselves. While there was no measure of self-esteem included in the research instruments, comments made during the interviews were quite telling. In Interview Three for example:

> Interviewer - "Were you happy with the grade you received for your last essay?" (The grade was a 'C')
> *"Yes that was quite good - I'm only a plodder you know, and I'm happy to scrape through."*
> I. "What about all the work you put into it? You did say that you worked hard for that one.
> *"Yes I know, But I never seem to be able to produce what's wanted - a 'C' is good for me."*

The same student had come to expect and accept negative feedback from her teaching practice visitors as well, as she put it during Interview Five:

> *"I don't think that I'm really cut out to be a teacher. I have a lot of trouble trying to get control. I didn't get a good report from the lecturer, but the kids were really awful that day."* 76 F. (R)

The negative attitudes towards studying expressed by another of the low achievers has already been quoted (see p.178).

In conclusion, the interview data revealed that the motivation underlying high academic achievement was idiosyncratic. Low achievers, however, did appear to have low self-esteem, and/or express more negative attitudes and disgruntlement.

CHAPTER EIGHT

RESULTS: LEARNING STYLE

This chapter is divided into two sections as follows:

Part 1 addresses the specific research questions with respect to learning style (research questions 6 and 7). These questions are entirely concerned with Pask's concept of a Versatile Style (Pask, 1977).

Part 2 deals with the Pask constructs other than Versatility. Specifically, these are the contrasting styles of comprehension learning and operation learning with their associated pathologies of globetrotting and improvidence respectively.

Part 1: Pask's construct of Versatility.

QUESTION 6. Will there be a general trend towards a more versatile learning style?

The following measures of versatility were adopted:

(A) Quantitative. Pask considered versatility as being that style which allows the learner to adopt either comprehension learning or operation learning as is appropriate to the learning task (see Chapter Two p.35). Thus, Entwistle and Ramsden (1983) suggested combining the sub-scales Comprehension Learning and Operation Learning to provide a measure of Versatile Style. In the present study the ASI Orientation Versatile Style suggested by Entwistle and Ramsden was used as a measure of student versatility with respect to learning style.

(B) Qualitative. Versatility might also be gauged empirically by noting student descriptions of how they go about various learning tasks. Such descriptions were available from the interview transcripts.

(A) The Quantitative Data.

TABLE 8.1 presents the means and standard deviations for the Versatile Orientation for each year of study in the Phase 1 research design (the longitudinal phase), and for each year in the Phase 2 research design (the cross-sectional phase).

TABLE 8.1 Means and standard deviations of the Versatile Orientation for each year of study in the longitudinal and cross-sectional phases.

PHASE	YEAR OF STUDY		
	Year 1	Year 2	Year 3
Longitudinal *	19.47 (4.09)	19.05 (3.97)	18.89 (3.74)
Cross-sectional	19.49 (4.08)	20.05 (3.58)	19.86 (4.23)

* Means and standard deviations are for the repeated measures sample (n=81).

It is clear from inspection of the means in TABLE 8.1 that there was no trend towards any increase in versatility across years, as measured by the Versatile scale of the ASI, for either of the research populations. The slight decrease in the means across years for the longitudinal population was not significant. The overall F-ratio for the main effect Years in the MANOVA tests was .68, and the level of significance for that F-ratio was .51. For the cross-sectional population the corresponding F-ratio was 1.46 with a level of significance .20.

(B) The Qualitative Data.

While the interview protocols were not constructed to specifically examine the Pask constructs, it was hoped that responses to questions aimed at eliciting students' approaches to various learning tasks might reveal examples illustrative of those Pask constructs. Versatility, for example, as defined by Pask, might have been demonstrated if a student adopted an operation learning style appropriately and successfully for one task, and a comprehension learning style appropriately and successfully for another. Unfortunately, however, lack of control over the nature of the tasks, lack of information as to the outcome of many of the tasks, and having to rely on the uncertain quality of student descriptions of how they had gone about or were going about the tasks (rather than actually observing them as Pask had done), made it very difficult to draw any firm conclusions.

Learning tasks described by students were generally essay writing, report writing (such as writing up a child study), producing lesson plans, and preparing for tests. There were also several practical tasks described such as music composition and conducting a sociological survey.

Essay writing and test preparation could be more easily described in terms of deep and surface-level processing than they could by Comprehension and Operation learning styles. That is, the most obvious distinctions that could be made were where students were simply regurgitating notes and pieces of text, compared to students who tried to understand the issues and express them in their own terms. Two distinct styles of essay writing did emerge, however, and these are described in Part 2 which deals with the styles and strategies other than Versatile.

With respect to versatility of style, students who described essay writing on more than one occasion invariably described the same general approach. While many students did claim to put more effort into understanding the topic as time went on, the general

way that they went about things procedurally was relatively constant.

Comparing one type of task with another was also rather inconclusive. Lesson plans, for example, were almost always structured in terms of a required format leaving little room for individual styles to emerge. Report writing, likewise, was usually constructed around pre-determined sections. With respect to lesson planning, some students claimed to have great difficulty in writing performance objectives at the beginning of a lesson and admitted that they usually wrote these after the event as something required by lecturers, but which were not really important to the lesson. This feature may indeed be related to a style of learning. If one is unable to visualize the end result of a lesson without first systematically going through all the steps (an operation learning style?), then one would have difficulty in forming clear objectives.

In conclusion, then, a versatile learning style as measured by the Versatile scale of the ASI did not develop as a function of experience. Again, student descriptions of how they went about their learning tasks tended to be task dependent and showed little variation within the same tasks.

QUESTION 7. **Will students who exhibit a high level of Versatile Learning Style early in their training have an academic advantage?**

The Final Grade (academic) as described in Chapters Six and Seven was again taken as a measure of academic attainment. The Versatile Style Orientation of the ASI as described earlier in the present chapter was used as the measure of variability of

students' learning styles. The question may be thus interpreted: Will students who had high scores on the Versatile Style scale early in their first year achieve better results academically than other students?

TABLE 8.2 provides a breakdown of the means for each graduation category (Distinction, Commendation and Ordinary) for each year of study, and the significance of the F-ratios from one-way analyses of variance of Final Grade Category by year.

TABLE 8.2 Cell means of the Versatile Learning Style for each graduation category (Distinction, Commendation and Ordinary), and for each year of study.

		GRADUATION CATEGORY			One-way sig. of	Compar'n p < .05
SCALE	Year	Dist.	Comm.	Ordin.	F	Scheffé
	1	21.36	19.92	19.08	.21	nil
VERSATILE	2	20.72	18.96	18.96	.41	nil
	3	19.20	18.36	19.11	.70	nil

With respect to the Year 1 means (which are those relevant to the question under consideration) it can be seen that the students who finally graduated With Distinction did, in fact, have higher scores on average on the Versatile Style scale than did students in either the Commendation or Ordinary groups. The F-ratios were not significant and follow up comparisons of means were therefore not strictly warranted. Contrasts, nevertheless, were considered, but as can be seen from TABLE 8.2, these did not reach significance at the .05 level using the Scheffé Range test. Contrasts using the less stringent t-test procedure showed that the Distinction group mean differed from the Ordinary group mean with a t-value of 2.04, and a one-tailed probality of .03. Thus there was a substantial but not significant trend which supported the affirmative answer to the question under discussion.

In another analysis, students whose score on the Versatile

Style Orientation was one standard deviation or greater above the mean were compared with the remainder of the student population with respect to their Final Academic Score. In this analysis the final grade score was used rather than graduation category. TABLE 8.3 displays the means and standard deviations on the Versatile Style scale, and the Final Grade (academic) for each group. Group 1 comprised the 16 students whose Versatile score was at least 1 s.d. above the mean (a raw score of 24 or greater). Group 2 comprised the remaining 70 students, and the overall means for the total first year population (n=86) are also given.

TABLE 8.3 Means and standard deviations on the Versatile Style scale of the ASI, and the Final Grade (academic) for Group 1 (the top 16 scores on the Versatile scale), and for Group 2 (the remaining 70 students, and for the total population (n=86).

	Versatile Style	Final Grade (Acad)
Group 1 (n=16)	24.56 (2.03)	65.50 (5.93)
Group 2 (n=70)	18.49 (3.49)	63.24 (6.75)
Total Pop'n (n=86)	19.67 (4.06)	63.70 (6.60)

From this analysis it can be seen that the students with the highest scores on the Versatile Style did have higher final grades on average than did the rest of the students. A t-test comparison of the means gave a t-value of 1.34 (probability one-tailed < .11). The two groups could also be compared by using non-parametric tests, perhaps more suitable because of the unequal n's. The Kolmogorov-Smirnov test tests the significance of the difference between the two frequency distributions. The resultant two-tailed t from this test was significant at the .05 level. This simply gives very similar results to the first analysis of variance: that is, there was a trend bordering on significance, for the versatile students to achieve better in the long run.

Part 2: Pask's other Styles and Pathologies.

In the section of the literature review dealing with learning styles it was explained how Pask suggested two contrasting approaches to what were principally problem solving tasks. These were: (1) The serialist approach, which emphasises a part by part strategy involving the testing and confirming of narrow hypotheses in series, and (2) the holist approach, which, as the name implies, involves more complex hypothesis testing at a more global level (Pask, 1976b). The tendency to adopt a serialist approach consistently Pask called an operation learning style, and the tendency to adopt a holist approach consistently he called a comprehension learning style. It should be noted that Pask makes the strategy-style distinction based on the criterion of consistency of approach, which was the distinction adopted for the present research.

Pask suggested that neither operation learning nor comprehension learning styles are complete in being able to lead to optimal learning. An over-reliance on one style to the exclusion of the other results in a learning pathology: improvidence in the case of operation learning, and globetrotting in the case of comprehension learning.

In their final version of the Approaches to Studying Inventory, Entwistle and Ramsden produced some items which, combined in sub-scales, they claimed logically underpinned Pask's constructs (Entwistle and Ramsden, 1983, p.41). These sub-scales and the descriptions attached to them by Entwistle and Ramsden are listed below:

Comprehension Learning (CL)	Readiness to map out subject areas and think divergently
Operation Learning (OL)	Emphasis on facts and logical analysis
Globetrotting (GLT)	Over-ready to jump to conclusions
Improvidence (IP)	Over-cautious reliance on details

(Entwistle and Ramsden, 1983, p. 180)

In addition to these sub-scales Entwistle and Ramsden suggested three orientations (other than the Versatile Style already described). These were:

Holist (CL + GLT)
Serialist (OL + IP)
Pathology (GLT + IP)

The logic underlying the first two combinations of sub-scales is a little unclear, since, by Pask's definition, the Holist Approach and the Comprehension Learning Style differ only in terms of the degree of consistency, as does the Serialist Approach and Operation Learning. Nevertheless, in the present study these orientations were included as a matter of interest in the various analyses performed on the sub-scales related to learning styles and pathologies. As with the previous sub-scales of the ASI which have been investigated in this research, the areas of interest were in developing trends as well as the relationship between styles and academic performance. Before discussing these issues, however, it is appropriate to consider data from the interviews which relate to the general Pask constructs. As was mentioned previously, when students were relating how they went about essay writing, two distinct styles could be distinguished. Some students (a minority), began by thinking about the question, determining what it really meant, discussing with others, then forming an overall plan for the essay. These students then selected material from their readings to fit with this overall design. Other students, however (and these were the majority), began by collecting resources, then underlining and extracting pieces which they thought would be relevant to the topic, and then attempting to construct a whole from the various bits and pieces. Three extracts from the interview transcripts will serve to illustrate these approaches or styles:

"Firstly I worked on the title, putting it into my own words so I could understand what they're getting at, then I noted how many

sections would be needed to cover the main arguments, like this Issues essay has four sections ... then when I did my reading I knew what to look for ... I'd underline bits, and note what section they would fit into ... then I link things up - structure them." 44. F. (R).

"First get the books out ... at least three weeks ahead, otherwise they're all gone. I go through and select bits - underline important points. Thats a start. Then I get on to reading around what I've selected out - make notes on that - that would take an hour or two I guess. One week out I start putting it together." 78. F. (R).

"... get the reference books and lecture notes. go through the various bits - write a brief summary about all the things that I read, then I try and put them all together."
Interviewer: "Have you an overall plan to guide you?"
"No - not really, it sort of emerges."
Interviewer: "What kind of feedback do you get?"
"Oh, about bits being not relevant or logical - I guess thats where I need a plan! But it takes such a long time." 23. M. (S)

The first extract is descriptive of a comprehension learning style. The student is concerned to get an understanding of the whole structure before deciding on the different parts and their relationships.

The second extract is most likely a description of an operation learning style. The student's first concern seems to be the selection of parts, and then fitting these together to make a whole. Logical analysis is implied in the decision about relevance and importance in the selection of the parts, and their compilation.

The third description is like the second in that there is an emphasis on parts, only in this case the student clearly has no 'road map' at all. This student also scored very highly on the ASI sub-scale Disorganized Study, and this extract indeed may

serve to illustrate the difference between an operation learning style and a disorganized approach to studying.

The main areas of interest with respect to the Pask Styles and Strategies were the investigation of trends over years, and the relationships of these constructs to academic achievement. For the investigation of trends, the data from Phase 1 and Phase 2 research designs were applicable. To determine the relationship between styles and academic achievement, only the Phase 1 data was pertinent as was explained earlier.

1. Trends in Learning Styles and Pathologies. MANOVAS were performed on the various sub-scales and orientations with the factor YEARS. The cell means and the resulting significance of the F-ratios are depicted in TABLE 8.4a for the longitudinal sample (Phase 1), and in TABLE 8.4b for the cross-sectional sample (Phase 2). A sample of the MANOVA statistics for the variable Improvidence Pathology with Years is presented in TABLE 8.6. With respect to the longitudinal population, the Improvidence Pathology showed a significant main effect with the within-subjects factor Years (probably because of this, the Serialist (IP + OL) and Pathology (GLT + IP) Orientations also reached significance).

Following the significant F's, the significance of the difference in the means from year to year were tested by means of t-tests for related samples. This revealed a significant decrease in Improvidence from Years 1 and 2 to Year 3. That is to say, it seemed that students became less inclined to place over-cautious reliance on details when they were in their third year. There was also a decrease in the Pathology Orientation from the first and second years to the third. Again this is probably due to the Improvidence contribution to that factor.

From TABLE 8.4b it can be seen that the trend towards a decrease in the Improvidence means from the first and second years to the third year was repeated in the cross-sectional

sample, but the overall F only reached significance at the .09 level. These students, however, also appeared to show a substantial but not significant increase in Comprehension Learning (and in the related Holist Orientation) over that time. This latter difference between the two populations of students mirrors the earlier findings with respect to approaches to studying and motivation. Following on from these earlier procedures, it was again considered of interest to investigate the differences that might eventuate due to the AGE factor with the cross-sectional group of students.

TABLE 8.4a Learning Styles and Pathology sub-scale means and the levels of significance of the F-ratios from repeated measures MANOVAS of sub-scales with the factor YEARS for the longitudinal sample (Phase 1). T-tests to test the significance of the comparisons from year to year followed for the sub-scales which had significant F's.

		SUB-SCALE MEANS YEAR			Level of Significance of comparisons YEARS		
Sub-scale	overall F	1	2	3	1 - 2	1 - 3	2 - 3
Comp. Lrng.	.75	8.67	8.42	8.42	-	-	-
Op. Lrng.	.57	10.80	10.63	10.47	-	-	-
Glb. Trot.	.28	8.06	8.54	8.04	-	-	-
Improv.	.00	8.74	9.01	7.59	-	.002	.000
HOLIST (CL + GLT)	.64	16.73	16.96	16.46	-	-	-
SERIAL (OL + IP)	.00	19.54	19.64	18.06	-	.006	.001
PATHOLOGY (GLT + IP)	.003	16.80	17.56	15.63		.06	.000

TABLE 8.4b Learning Styles and Pathology sub-scale means and the levels of significance of the F-ratios from MANOVAS of sub-scales with the factor Years for the cross-sectional sample (Phase 2). T-tests to test the significance of the comparisons from year to year followed for the sub-scales which had significant F's.

		SUB-SCALE MEANS			Level of Significance of comparisons		
		YEAR			YEARS		
Sub-scale	overall F	1	2	3	1 - 2	1 - 3	2 - 3
Comp. Lrng.	.06	8.64	9.56	9.29	.02	.14	.52
Op. Lrng.	.51	10.34	10.49	10.57	-	-	-
Glb. Trot.	.37	7.33	7.66	7.86	-	-	-
Improv.	.09	8.30	8.07	7.48	-	.04	.15
HOLIST (CL + GLT)	.06	15.98	17.22	17.16	.02	.08	.92
SERIAL (OL + IP)	.19	19.14	18.56	18.05	-	-	-
PATHOLOGY (GLT + IP)	.81	15.63	15.73	15.34	-	-	-

TABLE 8.5 MANOVA statistics for the Improvidence Pathology subscale of the ASI with the factor Years. Repeated measures analysis for the longitudinal population.

TESTS OF BETWEEN SUBJECTS EFFECTS

Tests of significance of T1 using unique sums of squares.

SOURCE OF VAR'N.	SS	DF	MS	F	Sig. of F
Within cells	1158.77	80	14.48		
Constant	17344.89	1	17344.89	1197.47	.000

TESTS INVOLVING TIME WITHIN SUBJECT EFFECT

Mauchly Sphericity Test W= .98602
Chi square Approx. 1.11239 with 2 df
Significance .573

Greenhouse-Geisser Epsilon = .98621
Huynh-Feldt Epsilon = 1.00000
Lower-bound Epsilon = .5

EFFECT TIME
(Multivariate tests of significance (S = 1, M = 0, N = 38 1/2)

Test name	value	Exact F	Hypoth df	Error df	sig.
Pillais	.19984	9.86492	2.0	79	.000
Hotellings	.24974	9.86492	2.0	79	.000
Wilks	.80016	9.86492	2.0	79	.000
Roys	.19984				

(F statistics are exact)

TESTS INVOLVING TIME WITHIN SUBJECT EFFECT
Averaged tests of significance for MEAS.1 using unique SS.

SOURCE OF VARIATION	SS	DF	MS	F	Sig. of F
Within cells	831.33	160	5.20		
TIME	92.01	2	46.00	8.85	.000

Styles and Pathologies and the factor Age.

As would be expected, age and year of study tended to co-vary. That is to say, students in the first year tended to be younger and students in the final year tended to be older. To determine the effect of age, adjusting for year of study, analyses of co-variance were appropriate tests.

Results from these tests revealed that Styles and Pathologies of Learning tend not to be age dependent. This stands in marked contrast to the relationship between the Approaches to Studying sub-scales and age discussed in Chapter Six. TABLE 8.6 presents the significance of the F-ratios resulting from analyses of co-variance for the Styles and Pathologies sub-scales with the factor Age as the co-variate.

TABLE 8.6 Levels of significance of the F-ratios for the factor Year and the covariate Age for the Styles and Pathologies sub-scales of the ASI. (Phase 2 research design).

SCALE	YEAR	AGE
Comprehension Learning	.14	.22
Operation Learning	.67	.41
Improvidence	.60	.08
Globetrotting	.48	.99
HOLIST	.18	.41
SERIALIST	.73	.12
PATHOLOGY	.90	.28

The Improvidence Pathology scale appears to be the scale most influenced by age. To illustrate the procedure further, the various analyses for this scale are presented in TABLE 8.7. From TABLE 8.7 it can be seen that while Improvidence did decrease quite significantly with age (level of significance of F = .01), the means also decrease as a function of length of experience in

TABLE 8.7 Cell means and multiple analyses of variance and covariance details for the Improvidence Pathology subscale of the ASI with the factors Age and Year of Study.

(A) Cell means, and Row and Column means for AGE and YEAR OF STUDY.

		AGE						Row means
YEAR	(n)	17	18	19	20	21-4	25+	
1	136	9.0	8.21	8.07	8.00	8.38	7.60	8.30
2	130		9.34	7.46	8.00	9.33	6.56	8.07
3	102		6.67	7.25	7.69	7.94	6.50	7.48
Column X		9.0	8.49	7.53	7.86	8.27	6.81	

(B) MANOVA: IMPROVIDENCE BY YEAR

	SS	DF	MS	F	Sig. of F
within cells	3022.48	365	8.28		
YEAR	40.5	2	20.25	2.45	.09

(C) MANOVA: IMPROVIDENCE BY AGE

	SS	DF	MS	F	Sig. of F
within cells	2939.43	362	8.12		
AGE	123.55	5	24.71	3.04	.01

(D) MANOVA: IMPROVIDENCE BY YEAR BY AGE

	SS	DF	MS	F	Sig.of F
within cells	2873.94	352	8.16		
AGE	67.04	5	13.14	1.64	.15
YEAR	13.95	2	6.98	.85	.43
AGE BY YEAR	44.11	8	5.51	.68	.71

(E) ANCOVA: IMPROVIDENCE BY YEAR BY COVARIATE AGE

	SS	DF	MS	F	sig.of F
within cells	2996.97	364	8.23		
REGRESSION	25.51	1	25.51	3.10	.08
YEAR	8.49	2	4.25	.52	.58

the institution (Year of Study). The analysis of covariance results, however, suggest that for this scale, age is the main contributor to the variance, but the level of significance of the F is less than for the analysis without taking Year of Study into consideration. From Section D in TABLE 8.7 it can be seen that the age by year interaction was not significant.

These results, indicating that Styles and Pathologies of Learning (with the possible exception of the Improvidence Pathology) are largely independent of age, would seem to lend empirical support for the Style - Strategy distinction (remembering that Strategies tended to be age-dependent and Styles tend to be relatively permanent characteristics).

2. Styles, Pathologies and Academic Performance. Following the procedures already described in the two previous results Chapters, the Styles and Pathologies sub-scales were correlated with Final Academic Grades for Years 1 and 2, and also with the Final Grade Academic at the end of the third year, which took into account students' performance over the full three years. MANOVAS were also performed on these sub-scales with the Final Grade Academic Graduation Categories (Distinction, Commendation and Ordinary).

Correlation Results: TABLE 8.8 presents the Pearson correlation coefficients for the Year 1 sub-scales with the Year 1 Academic Grade; the Year 2 sub-scales with the Year 2 Academic Grade, and the Year 3 sub-scales with the Final Grade Academic. These results reveal that except for a slight positive correlation in the first year, Comprehension Learning and HOLIST Styles correlated negatively with academic performance. This negative correlation was strongest in the third year. The Globetrotting Pathology also had a relatively substantial negative correlation in the third year.

The Operation Learning Style was the only sub-scale with a consistent positive correlation, although the relationship was not strong.

TABLE 8.8 Pearson correlation coefficients for the Year 1 Style and Pathology sub-scales of the ASI with the Year 1 Academic Grades, the Year 2 sub-scales with the Year 2 Academic Grade, and the Year 3 sub-scales with the Final Grade Academic.

	YEAR OF STUDY		
Sub-scale	Year 1	Year 2	Year 3
Comprehension Learning	.16	-.12	-.21*
Operation Learning	.09	.18*	.06
Globetrotting	-.03	.13	-.33**
Improvidence	-.13	.16	-.11
HOLIST	.08	-.01	-.33**
SERIALIST	-.02	.22	-.04
PATHOLOGY	-.09	.14	-.22

(* $p < .05$; ** $p < .01$)

According to Pask, learning styles would not be expected to correlate strongly with academic success unless the associated pathologies were avoided. The pathology which had the most serious detrimental effect on academic performance in this research would appear to be Globetrotting, but only in the third year.

MANOVA results: TABLE 8.9 presents the cell means for the various Styles and Pathology sub-scales for Year of Study, and the Final Grade Academic categories (Distinction, Commendation and Ordinary). The significance of the F-ratios for Style by Graduation category (disregarding Year of Study) are presented in the second column. One-way Analyses of Variance for Style by Year were also performed and comparisons between years were made for the sub-scales that had F-ratios significant at the .10 level or greater. None of the comparisons between Years reached significance at the .05 level with the Scheffé Range test.

TABLE 8.9 Cell means for the Styles and Pathology sub-scales for each graduation category (Distinction, Commendation and Ordinary), and for each Year of Study.

SCALE	O'all sig. of F	Year	GRADUATION CATEGORY Dist.	Comm.	Ordin.	One-way sig. of F	Compar'n p < .05 Scheffé
Comp. Lrn.	.20	1	10.81	8.68	8.48	.11	nil
		2	10.10	7.32	8.72	.06	nil
		3	8.70	7.68	8.76	.43	nil
Op. Lrn.	.29	1	10.84	11.24	10.65	.62	nil
		2	10.40	11.64	10.13	.09	nil
		3	10.50	10.68	10.35	.87	nil
Glb.trot.	.11	1	8.10	7.04	8.61	.34	nil
		2	8.30	7.84	8.98	.26	nil
		3	6.70	7.68	8.52	.13	nil
Improv.	.45	1	8.50	9.12	8.59	.55	nil
		2	8.20	9.16	9.12	.76	nil
		3	6.20	7.64	7.87	.27	nil
HOLIST	.21	1	18.80	15.72	16.83	.30	nil
		2	18.40	15.16	17.63	.08	nil
		3	15.40	15.36	17.28	.24	nil
SERIALIST	.40	1	18.90	20.36	19.24	.42	nil
		2	18.60	20.80	19.24	.28	nil
		3	16.70	18.32	18.22	.62	nil
PATHOLOGY	.26	1	16.60	16.16	17.20	.92	nil
		2	16.50	17.00	18.09	.65	nil
		3	12.90	15.32	16.39	.08	nil

The results described thus far have been related to the learning styles and pathologies as defined by Pask and as derived from sub-scales of the ASI suggested by Entwistle and Ramsden (1983). It must be remembered, however, that these particular sub-scales were the least reliable of those in the inventory (see Chapter Five). Accordingly, it was considered informative to study the Factor scales produced by factor analysis of the ASI in the present research to see whether any of the Factor scales were descriptive of learning style. It seemed to the present researcher that the Factor Scale 3 Careful and Logical Approach could well represent an operation learning .style. While it was initially intended to categorize this factor as an Approach to Learning (as its title suggests), analysis of the items comprising the scale (see APPENDIX C.1) revealed that four of the seven items were from Entwistle and Ramsden's Styles and Pathologies sub-scales, and the item which had the highest loading on the Factor scale - "I think it is important to look at problems rationally and logically without making intuitive jumps." (factor loading .75) - suggested that there were good grounds for categorizing the scale as a style.

Submitting this factor to the procedures outlined earlier for detecting trends, and investigating the relationship of the style to academic performance, produced the following results:

Trends: TABLE 8.10 presents the means and standard deviations for the learning style Careful and Logical Approach for each year of study in both the Phase 1 and Phase 2 research designs.

The difference in the means across years was not significant for the cross-sectional sample, but in the longitudinal phase, the F-ratio from the MANOVA test was significant at the .05 level. Year 1 students tended to score higher on this scale than Year 2 or Year 3 students.

TABLE 8.10 Means and standard deviations of the Careful and Logical Style for each year of study in the longitudinal and cross-sectional phases.

PHASE	YEAR OF STUDY		
	Year 1	Year 2	Year 3
Longitudinal *	18.97 (4.60)	17.78 (4.38)	17.91 (4.03)
Cross-sectional	18.72 (3.96)	18.41 (3.56)	18.17 (4.11)

* Means and standard deviations are for the repeated measures sample (n=81).

The effect of Age on the Trends: Whether the significant decrease in the means as a function of year of study in the longitudinal sample was due to length of experience in the college or due to the fact that older students tend to be in the senior classes, was determined in the same manner as described earlier, that is, by the analysis of covariance procedure. TABLE 8.11 presents the cell means for each each age category for each year of study in the cross-sectional population.

TABLE 8.11 Cell means for the Careful and Logical learning style for each age category and for each year of study.

		AGE						Row means
YEAR	(n)	17	18	19	20	21-4	25+	
1	136	17.70	19.47	18.85	18.00	18.07	17.50	18.72
2	130		20.50	17.48	17.78	19.33	18.56	18.41
3	102		20.67	17.75	17.25	18.79	18.78	18.17
Column		17.70	19.80	17.75	17.56	18.71	18.38	

Neither the age factor nor the year of study was significant in the ensuing analyses. While there were considerable differences in the age category means, there was no discernable pattern other than that 18 year olds and students over 21 years of age tended to score higher on average than other students.

Thus it would appear that the Careful and Logical Style is independent of age and length of experience in a tertiary institution.

The Careful and Logical Style and Academic Performance:

TABLE 8.12 presents the means for the Factor scale Careful and Logical Approach for each Graduation Category (Distinction, Commendation and Ordinary) for each year of study.

TABLE 8.12 Cell means of the Careful logical Learning Style for each graduation category (Distinction, Commendation and Ordinary), and for each year of study.

SCALE	Year	GRADUATION CATEGORY Dist.	Comm.	Ordin.	One-way sig. of F	Compar'n p < .05 Scheffé
Careful-	1	17.7	20.76	18.28	.08	nil
Logical	2	18.30	19.28	16.85	.12	nil
	3	18.10	18.60	17.50	.55	nil

The F-ratio for the MANOVA Graduation Category by Year was significant at the .06 level. The Distinction group means increased slightly over the three years while the Commendation and Ordinary Group means decreased slightly. The interaction effect of Graduation Category by Year was not significant however. The pattern where the Commendation group tended to have higher scores than the other two groups is similar to the pattern observed for the Achievement Motivation sub-scale (see Chapter Seven, p.187). It would seem that this middle group of students not only had higher Achievement Motivation on average, but that they also tended to be more careful and logical in their style of learning.

Concluding Statement

It seems appropriate to conclude this chapter with a comment on the relationship between learning style and approaches to studying.

Entwistle and Ramsden suggested a model to explain this relationship (Entwistle and Ramsden, 1983, p.42). That model, which seems to explain clearly the relationship between Styles and Pathologies and the Deep and Surface approaches to learning, is reproduced below in FIGURE 8.1.

<table>
<tr><td rowspan="2">APPROACH OR STYLE</td><td colspan="2">PROCESS</td><td rowspan="2">Outcome</td></tr>
<tr><td>Stage I</td><td>Stage II</td></tr>
<tr><td>Deep Approach/ Versatile</td><td colspan="2">All four processes below used appropriately to reach understanding</td><td>Deep level of understanding</td></tr>
<tr><td rowspan="3">Comprehension Learning</td><td colspan="2"></td><td rowspan="3">Incomplete understanding attributable to Globe-trotting</td></tr>
<tr><td>Building overall description of content area</td><td>Reorganizing incoming information to relate to previous knowledge or experience and establishing personal meaning</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td rowspan="3">Operation Learning</td><td rowspan="2">Detailed attention to evidence and steps in the argument</td><td rowspan="2">Relating evidence to conclusion and maintaining a critical, objective stance</td><td rowspan="3">Incomplete understanding attributable to Improvidence</td></tr>
<tr><td></td></tr>
<tr><td>Surface Approach</td><td>Memorization</td><td>Overlearning</td><td>Surface level of understanding</td></tr>
</table>

FIGURE 8.1 A Model of Styles and Approaches to Learning. (From Entwistle and Ramsden, 1983, p.42)

While this model does seem to encapsulate the relationship between Styles and Pathologies rather well, in the view of the present writer it has two weaknesses. Firstly, it appears to equate a deep approach to learning with the Versatile Learning Style. This is inconsistent with the meanings given to these constructs by Marton (1975), and Pask (1976b) and, indeed, by Entwistle and Ramsden themselves. Basically, a deep approach refers to the intention of the learner to find meaning in the learning material and thus engage in deep-level processing, while versatile style is the capacity to adopt either comprehension learning or operation learning appropriately. These do not appear to be the same thing. As a matter of interest, in the present research, the two sub-scales Deep Approach and Versatile Style were correlated in both phases of the research design. The correlation coefficients were as follows:

Phase 1 (The longitudinal population)

	Year 1	corr. = .30	($p < .003$)
	Year 2	corr. = .45	($p < .000$)
	Year 3	corr. = .13	($p < .11$)
Phase 2	Year 1	corr. = .36	($p < .000$)
	Year 2	corr. = .30	($p < .000$)
	Year 3	corr. = .31	($p < .001$)

Thus, while there is a moderately strong relationship, it is not so strong as to suggest that the same construct is being measured.

The second problem with the Entwistle and Ramsden model is that it appears to lose sight of the criterion of consistency which is a defining characteristic of learning style. The relationship between styles and pathologies and approaches to studying, are therefore still rather hazy apart from the issue of consistency.

CHAPTER NINE

RESULTS: GENERAL DEVELOPMENT

Research Questions 8 and 9 were concerned with students' general development, viewed from the perspectives of the teaching staff and the students themselves. The two research questions were as follows:

QUESTION 8. To what extent will students become better learners over three years?

QUESTION 9. How do faculty perceive student development, and do their perceptions correspond with student perceptions?

The three previous results chapters have all impinged on Question 8 in their discussion of developmental trends in approaches to studying, motivation and learning styles. Again, Question 9 impinges on Question 8 if the latter question is considered from the point of view of teaching staff. Nevertheless, Research Questions 8 and 9 were pursued systematically in the present study by means of student case studies and staff interviews. In this chapter a brief summary of the relevant findings from the previous results chapters is provided, followed by the six case studies relevant to Question 8. It is hoped that the in-depth nature of the case study data will enhance the picture of student development that has already emerged. Staff views on the matter of students becoming better learners will be held over to Question 9 where staff perceptions of students' general development will be discussed.

QUESTION 8. To what extent will students become better learners over three years?

Before introducing a brief review of results from the previous three chapters, it should be made clear what is meant by the term 'better learners'. Within the context of the present research, better learners are those who adopt a meaningful approach to studying and who are flexible with respect to learning style (i.e. are versatile learners). Better learners will also have positive attitudes towards learning, and will approach new tasks with confidence. They will also be interested in learning how to learn, and finally, because of the context in which they are studying, they will be concerned to apply what they have learned to their own teaching situations.

Summary of Relevant Findings from Previous Chapters.

The longitudinal and cross-sectional populations produced conflicting results. Students in the longitudinal population (Phase 1 Research Design) did not appear to develop as better learners and, in fact, seemed to develop in a reverse direction: they showed an increase in surface learning and superficial approaches, with a corresponding decrease in deep and thorough approaches to learning. Although students in the interview sample from this population appeared to go against this trend, most of the improvement in studying claimed by these students was concerned with the time and effort they put into studying rather than with developing more meaningful approaches (48 percent compared to 26 percent). It is also likely that participating in the research had a positive influence on this group.

Students in the cross-sectional population (Phase 2 Research Design) tended towards increases in the meaningful approaches to learning over the years, and decreases in surface-level,

disorganized, and superficial approaches (the trends for this latter group of approaches were not statistically significant however).

The students in the longitudinal sample revealed motivational characteristics that generally mirrored their negative trends with respect to being better learners. They expressed more negative attitudes, were more disgruntled, and relied more on extrinsic motivation than did their counterparts in the cross-sectional population. These latter students developed an increase in their enthusiasm for learning and decreased their need for a highly structured learning situation arising from a decrease in their need to succeed.

The reason for the difference between the two student populations is most likely to be the age factor. Students appeared to develop as better learners as a function of age, and the cross-sectional population had more students in the older age groups. The college programme had also changed, and while the changes were intended to introduce better learning conditions, it is impossible to say how much of the difference was due to that factor.

Students with a versatile learning style early in their course of study did tend to achieve better results academically in the long run, but versatility as a style did not increase significantly over the years in either of the student populations.

The results described above stemmed principally from psychometric analyses of questionnaire data, supplemented by information from student interviews. As described in Chapter Three (p.95), six cases from the total interview sample were selected for closer analysis and more extended reporting. These case studies were analysed with respect to the question under discussion: To what extent do students become better learners over three years? While the results from this analysis emphasized the uniqueness and individuality of the students

rather than revealing common patterns of development, nevertheless, the data does add more colour to the tapestry of student development. ASI profiles for each case study are contained in APPENDIX C.5)

The Case Studies

(The names used in the descriptions that follow are not the real names of the students involved.)

Case Study 1: Mary (Subject code 02)

Mary was 17 years of age when she entered teachers college in 1983. She came from a neighbouring town, and for the first year, lived in the halls of residence. In the second and third years she lived in flats with other students.

On the Anxiety Scale administered early in the first year Mary scored well below the mean, indicating a very low level of state anxiety. On the Commitment to Teaching Scale she also scored at a level considerably below the mean. Teaching was not her first choice of a career. She had wanted to enter medical school or art school ahead of teaching, but chose the latter because she realized that she did not have high enough grades in her final school examinations to permit her entry to these other schools. Teaching seemed to her to be a good choice because it could not only be satisfying, but teaching qualifications could be useful in gaining employment overseas. Mary had a great desire to travel and her plan was that, after teaching for a year or two, she would have earned enough money to enable her to do so.

Features of her ASI profile in Year 1 (see APPENDIX C.5.1) were the very low scores on the Meaning Orientation and on the Factor Scale Exploratory-logical; and very high scores on

Surface-confused, Disorganized Study, Disorganized and Dilatory and the Safety-first Approaches.

In the first interview Mary described the approach to learning she had used at secondary school in typical surface learning terms. After a nearly a year at teachers college, however, she felt that she was changing in this regard. She was not satisfied with her method of studying, feeling that she lacked the discipline needed to really sit down and work. At the time of the second interview, she said that the subjects that she was enjoying most were Art and English. She put a lot of time and effort into these subjects, but admitted that this was at the expense of assignments in her other subjects. For these, she felt that she never had enough time, was usually late in getting started, and continually had the feeling of "things hanging over my head."

Early in her third year, Mary felt that she was putting more effort into the understanding of issues:

> *"My attitude now is to find meaning - and this has made things more relevant and interesting - like Sociology of Education - we had this research to do on Beginning Teachers...it was really very interesting."*
>
> (Interview 4)

Even so, Mary was not highly motivated to achieve well in terms of gaining high grades. So long as she passed, she was satisfied. In the third year her achievement motivation as measured by the ASI was extremely low, as indeed was her score on the sub-scale Intrinsic Motivation.

Neither did Mary have any desire to continue studying after leaving college - a position that she maintained constantly over the five interviews. Nor did she develop any strong commitment to teaching. She enjoyed her experiences during teaching practice, but during the third year interviews, claimed to be only moderately committed. While on teaching practice she did not make direct links between theory and practice, and on this subject said:

"I suppose some things came through - but I wasn't conscious of it."
(Interview Three)

Mary seemed to be motivated principally by the things that interested her, especially if these involved practical activities such as her art work and drama. Her preference for independent work has already been quoted (p.165). Although she was quietly confident about her academic work she derived little satisfaction from it. The impression she gave was that it was a means to an end, and the end she had in mind was travel.

Mary finally graduated with distinction. At no stage during the interviews could a prediction have been made as to her ultimate success at college (her Year 1 and 2 grades were mostly in the C+ to B+ range, with the exception of Art where she got A's). The picture gained from the interviews was of a fairly 'laid back', relaxed young woman who was happy to 'get by', but who usually felt a little guilty about all the work she had to do but hadn't yet started. From the ASI profiles the only hint of final success was the very high score on the Strategic Approach in the third year.

Was Mary a better learner after three years at college? The ASI profiles would suggest a definite 'No'. Her academic success at college would suggest a definite 'Yes'!

The interview transcripts generally described a young woman who enjoyed some courses intensely, and gradually took an interest in others. Her own summing up of her three years, however, was revealing:

Year 1. *"A good introduction. Some things weren't relevant. I was not well informed, and had to change my mind as to what I thought teaching was about."*

Year 2. *"Relaxing, frustrating (on section),- a success socially, but a bit mediocre otherwise."*

Year 3. *"Relevance at last! Enjoyment, confident and interested."*

This summary certainly gives a picture of positive development. She was finding relevance; enjoying her courses; was confident in her ability and was settled and interested. It would seem that, in these regards, Mary did become a better learner. There remains a marked discrepancy, however, between what she expressed in interviews and how she responded to questionnaires!

Case Study 2: Phillip. (Subject code 08)

Phillip was also 17 years of age when he started at college, and came from the same neighbouring town as Mary. Like her, he lived in the halls of residence for the first year and then moved into a flat. Teaching was Phillip's first choice of career. On the Expressed Vocational Commitment Scale (EVCS) his total score was +1.2 standard deviations above the mean. Throughout the series of interviews he consistently rated his commitment as 'Very High'. Phillip appeared to be very much influenced by a teacher friend of the family who had become something of a mentor, and who had inspired him to be a teacher.

The learning strategy adopted by Phillip at school stemmed from advice given by his teacher friend and was aptly labelled by Phillip as 'summarize and memorize'. The main features of Phillip's ASI profile (see APPENDIX C.5.2) were as follows:

> Consistently low scores in the Meaning Orientation.
> Consistently high scores in Need for Success, Achievement Motivation, Syllabus Bound and Surface Approach.

During each of the interviews Phillip usually appeared well motivated, cheerful and enthusiastic. He had a good study routine, but adopted rather sterile techniques. The 'summarize

and memorize' habit was well ingrained. Over the years he developed a strong interest in the university subject Geography. He particularly liked this subject because "*...it requires researching, and formulating opinions based on research.*" At about the end of the second year he expressed the goal of wanting to complete a Master's degree majoring in Geography and Education, and he kept this goal clearly in front of him for the remainder of his time at college. This academic goal, and the high level of commitment to teaching appeared to be the main motivational influences on Phillip. His own list of the factors that raised his motivation were:

Personal interest in the topic.
Ability to achieve personal goals.
The challenge of work.

Successful teaching experience, especially in the final year, also appeared to be particularly motivating.

> "*It* (the Teaching Practice) *has dramatically increased my commitment. I've totally changed my teaching style after having an Associate Teacher who was an excellent model. I'm much more confident now.*"
>
> (Interview 5.)

With respect to the linking of theory and practice while on section in the schools, he said that he was able to apply what he had learned in an English language study course, particularly with respect to language development. He also claimed to have benefitted from the micro-teaching work done in one of his courses. He did not appear to relate anything specific from learning theory.

Like most of the students, Phillip had part-time employment outside college hours to help him survive financially. He worked in a restaurant as a wine waiter three nights a week. He was able to cope with this quite well in spite of a very heavy work-load in his third year (he claimed to have had 29 contact hours a week in the first semester).

Did Phillip become a better learner over the three years?

He certainly had good attitudes, and a strong level of achievement motivation. He had academic ambitions and seemed to enjoy most of his subjects --- yet the ASI profiles suggested that this was not matched with any increase in a more meaningful approach to learning. The early high levels of Surface approach and Syllabus Boundness were maintained over the three years. The interview data generally confirm the questionnaire findings. Although a hard worker, Phillip never developed beyond the 'summarize and memorize' approach to learning espoused by him at the beginning of his three years, and, probably as a consequence of this, he only received average grades in spite of all his effort.

Phillip's own summary of his three years was as follows:

Year 1. *"Excellent, full of interest and novelty. More activity would have been good."*

Year 2. *"Hard work; refreshing. Created a realization of what it's all about."*

Year 3. *"Slightly disallusioned; less enthusiastic; the best section. More confident about my own ability to teach."*

Phillip did not appear to develop as a better learner. He was a young man who seemed to be hamstrung by an inappropriate, inflexible approach to learning.

Case Study 3: Candy (Subject code 39)

Candy was a local woman who lived at home throughout her time at college. Aged 18 at entry, she was a little older than the average first year student. Candy had left school after the

sixth form and tried to find employment. She was five months unemployed before finding a job in a shop. This experience of unemployment made a considerable impression on her, and the anxiety of getting a teaching position after completing training was constantly with her, expressed during interviews with such comments as, *"It would be terrible if all this was for nothing." and, "I'd hate to go through that again."*

Teaching was Candy's first choice of career, but she had not held that desire for long. Her score on the EVCS was very high, and during the interviews she consistently rated her level of commitment as (1) - the top of the scale.

While at school Candy's method of studying was to write out trial answers to anticipated questions and then learn these by heart. Near the end of her first year at college, she thought that her method of study had improved somewhat but could still improve more. She equated improvement in study methods with results: *"Like in the first term I got C's, in the second term, B's and in the third term I've got mostly A's."* Candy's description of how she went about essay writing in the first year was a classic description of a strategic approach and has already been quoted (see p.139).

The ASI profiles (APPENDIX C.5.3) revealed considerable variation. Some of the main features were:

> In the first year: Very high scores on Factor scale 3 (Careful Logical Approach); high scores on Syllabus Boundness, Surface Approach, Reproducing, Strategic Approach, Comprehension Learning and Versatile Style. An extremely low score on Need for Success.
>
> In the second year: Extremely high Reproducing score (main contribution from Fear of Failing and Surface Approach).
>
> In the third year: An increase in Deep Approach

and Relating Ideas. A high score on Strategic Approach. Throughout the three years there were consistently low scores on Intrinsic Motivation and Enthusiasm for Study.

During the second year interviews - at a time when the ASI profiles were suggesting a rather extreme degree of surface-level processing - Candy described her approach to tasks on which she was currently engaged in meaningful learning terms. For example, when discussing the preparation for an essay on teacher accountability, she said that she had very strong views on the subject, believing that teachers should not be held fully accountable for student learning. She then proceeded to argue the case for non-accountability in very cogent terms, revealing that she had read widely, and was particularly concerned about the effects that excessive demands for accountability had on the teaching practices of some of the States in the U.S.A. Then, when discussing a geography assignment, she commented:

> *"...I've been reading about the Pacific Islands. I didn't realize that there were so many different cultures - Melanesian, Polynesian and Micronesian and so on ... and the land problems, the divisions, and the effect colonialism has had. I appreciate how the Maoris must feel now. I've learnt a lot about social behaviour."*

Also, when explaining standard deviation in her own words, she gave a perfectly good (albeit somewhat concise) explanation, indicating that she understood the concept fairly well. Clearly Candy was not a surface learner. She had thought deeply about issues and expressed value judgements that were her own. It is difficult to explain the mismatch between what she was actually doing, and what she was expressing in her responses to questionnaire items.

This mismatch also applied to motivation. In the interviews she consistently expressed a desire to complete a fourth year studentship, and was one of the few students who expressed the goal of wanting to graduate with distinction - yet, her ASI

profiles suggested moderate to low achievement motivation, a low level of need for success and extremely low scores on Enthusiasm for Study.

Candy was also one of the few students in the interview sample who appeared to have a 'missionary' approach to teaching. She did not simply want to be a teacher - she wanted to be a good teacher. She was highly critical of the present education system, and of several teachers she had encountered on teaching practice. For example:

> *"I had a bad section (Third Year) but that has made me more determined than ever to succeed. I now realize how many unfit, poorly qualified teachers there are out there, who are ...impractible (?) ... they are...(*--the recording was unclear) *... and how schools need more youthful, exciting teachers. I got my first taste of school politics too - the power structure - all the back stabbing, jealousy, vicious comments ... it has motivated me all right* (the Teaching Practice) *... motivated me to succeed even more in this profession."*

Factors that raised and lowered her motivation were:

Raised motivation:	practical experiences
	positive reinforcement
	good results, good feedback.
Lowered motivation:	academic experiences
	peer competition and peer cheating
	unfair results

Candy often appeared stressed and intense during interviews. The suicide of a close friend affected her badly in the first year (see APPENDIX B.2, p.62). In the second year she had boyfriend trouble - an 'off-again, on-again' romance. She had considerable out of college interests, especially in the third year. She was involved in singing and dancing groups; taught dancing to private pupils and was still taking lessons herself.

She spent two half days a week teaching dance at a local secondary school and, on top of this, she worked as a telephone receptionist every evening during the week and occasionally at weekends. Candy coped with this very busy life by being extremely well organized, and by adopting a strategic approach to studying.

Was Candy a better learner after three years?

She graduated with distinction. She was an extremely well organized and hard worker who, in discussion, demonstrated a good understanding of issues. She was also a critical thinker, who thought deeply about teaching. On the other side of the coin, however, her ASI profiles certainly did not give the impression of a better learner, rather the reverse.

In the interview situation Candy said on more than one occasion that she was enjoying all her subjects and that she wanted to do further study. Yet a strong anti-academic, anti-theoretical stance was evident in her responses to questionnaire items.

Her summing up of her three years?

Year 1. *Too academic*

Year 2. *Relaxing, interesting, practical, worthwhile*

Year 3. *Too much work; time consuming; trivial tasks; too academic.*

Candy, then, was a rather complex young woman, driven by an almost messianic zeal to succeed in teaching. She was successful academically, and certainly in the classroom as well, but was she a better learner as a result of her experiences at college? Probably, but, because of the conflicting picture she gave of how she went about learning (from her responses to questionnaire items, and from the descriptions she gave in the interviews), it is difficult to be really sure. This point is taken up further in the general comments which follow the case studies.

Case Study 4: Lisa (Subject code 44)

Lisa, a Maori student, was 18 years old when she started at college from her seventh form year. Her home town was Rotorua, and during her first year at college she lived with relatives in Hamilton. Lisa did not get off to a good start at college. Early in year 1 her uncle had been drowned while on a fishing trip, and the body was not recovered until about five weeks after the event. This was a particularly traumatic situation for a Maori family, and Lisa spent a great deal of her time in the first two months of college at her uncle's marae. This situation reflected adversely on her settling-in period at college.

Teaching was her second choice of career. She had wanted to be social worker, but because there was no vacancies in social work at Rotorua, she applied for and was accepted into teachers college. Although teaching was only her second choice, her score on the EVCS was relatively high. At the end of that particular questionnaire, however, she had written the following comment:

> *"The workload gets everybody down. At the moment I could almost walk out without hesitation despite my commitment to teaching."*

In point of fact, nobody else had complained about workload at this particlar time (after only 8 weeks at college), and the statement more likely reflected Lisa's great difficulty in coping with what work there was because of the stressful family situation at that time.

Lisa had a very high score on the STAI anxiety questionnaire, and this high level of anxiety was confirmed by remarks she made during interviews about how she worrried a lot about tests and examinations.

When at school, Lisa's method of studying was to make notes which she revised often, and then tried to write sections about a topic without reference to her notes. In Interview One she expressed dissatisfaction with this approach because she felt that she was not utilizing enough information:

"I get the feeling that I don't really know enough about the topic - there's just so much to know and I'm only scraping the surface. I know only a tiny bit of it, so I'm never satisfied with what I hand in."

Lisa's ASI profiles are interesting because she was one of only a few in the interview group who seemed to have a deep approach to learning early in the first year. Particular features of her ASI profile were:

Factor Scales:
- High on Open Questioning Approach
- High on Questioning-adventurous Orientation
- Low on Achievement-structured Approach
- Low on Non-confident Approach

Entwistle Scales:
- High on Meaning Orientation in Year 1 (this stemmed mainly from very high scores on Relating Ideas and Comprehension Learning), but the Meaning scores decreased over the three years (T-scores were 61, 53 and 41).
- Deep Approach and Surface Approach were both about average.
- Intrinsic Motivation was low in Year 1, but increased dramatically in Year 2

Lisa's descriptions as to how she went about various tasks generally matched this profile. For example, this account of preparing for an essay in Year 2:

"First I work on the title, putting it into my own words so that I can understand what they're getting at. Then I note how many sections would be needed to cover the main arguments ... then when I did my reading, I knew what to look for ... I'd underline bits and note what section they would fit into. I make notes - but because I put them in my own words - its my notes and I can understand them. Then I link things up - structure them. It's all fairly fluid. I change things around a lot, and when I hand it in I'm still not satisfied with it."

She was also able to relate the theoretical ideas studied at college to the classroom situation:

> *"I had a really difficult class - I found that what we had learned about behaviour modification was really useful. Some children were on special programmes worked out by the psychologist and I could help with these. It was interesting to see the very low self-image a lot of these kids had and how that affected their learning."*

Lisa tended to react badly to negative feedback. On getting a D for an essay early in Year 2, rather than striving harder to make up for it, she developed a negative attitude to that course - and towards the lecturer who had marked her essay! On the other hand she responded very well to positive feedback. In Year 3, when asked what were the factors that most influenced her approach to studying, she replied:

> *"Workload!*
> *How much I like the subject.*
> *Confidence -- like for Social Studies, that's no bother 'cos I'm confident. Music is different 'cos I'm hesitant.*
> *Feedback from my tutors - I never thought I was good at anything, but I've had some really good comments so I must be O.K."*

The comment, *"I never thought I was good at anything"*, is interesting, because, in point of fact Lisa had achieved very good marks in her School Certificate examinations.

When asked whether her way of studying had changed over three years, she thought that she was more efficient and probably less conscientious after three years at college:

> *"I'm better organized, in that I know what I'm about and what's wanted. Experience I guess - you know what is expected."*

This comment possibly goes some way towards explaining the drop in Lisa's Meaning Orientation scores over the three years. 'Workload', as Lisa had said, affected her approach to studying. The higher workload in Year 2, and especially Year 3, could only

be coped with by trimming back on her attempt to find meaning in the learning material by reducing the scope of her research and the amount of time she could give to an assignment.

Lisa was also one of the very few students who said that getting good grades was really important:

> *"I find now that achieving academically is more important. I have cut down a lot on social activities like the Maori club."*

The attainment of academic goals featured strongly in Lisa's interview transcripts. She consistently affirmed her intention to do a fourth year in order to complete her Bachelor of Education degree, and she several times mentioned her intention to work for a Master of Education degree at a later stage.

Factors that raised and lowered her motivation over the three years were:

Raised motivation: The need to succeed
Teaching practice
Personal relationships

Lowered motivation: No interest in the subject
Attitude to some lecturers
Pressure of time

Lisa spent her final period of teaching practice in a bi-lingual school and this seemed to have made a strong impression on her:

> *"It (the section) boosted my commitment very highly. It has put the three years in perspective - made me look at myself as a person and as a Maori."*

Lisa's final summary of her three years reflect much of what has already been reported:

Year 1. *Unrealistic; frightening; anxious; some success; new experiences*

Year 2. *Disruptive* (Lisa had gone flatting in the second year, but went back to living with relatives in Year 3); *hard work; success; increasing confidence; teaching practice was great.*

Year 3. Hard work; maturity; friendships; growth as a person and as a teacher; my first goal achieved.

Was Lisa a better learner after three years in college?

Lisa had adopted a deep, meaningful approach to learning early in her first year but had to modify it to meet the demands of a heavy college programme. Thus, in a sense, the college programme was not really suited to her needs as a learner. It is unlikely, however, that Lisa became a worse learner despite the decrease in her Meaning Orientation scores. Her attitudes remained positive, and there was not an increase in the surface-level approach to learning. Lisa also achieved well academically in that she graduated with commendation. She grew in confidence, and there was evidence that she was well on the way towards self-actualization.

Case Study 5: Katie (Subject code 70)

Katie was 17 years old at entry. She was a Hamilton woman, but instead of living at home while attending college, she boarded with her elderly grandmother. This arrangement seemed to suit the family more than it did Katie, because while the old

lady had company and care, it put considerable strain on a young woman entering into tertiary study for the first time. In the third year the grandmother was terminally ill and Katie looked after her until she died near the end of that year. Katie never complained about her situation but it was obviously quite stressful for her.

Although teaching was Katie's first choice of career, her commitment to teaching as measured by the EVCS in the first term was only moderate. Commitment tended to vary considerably from one interview situation to another. Following a successful teaching practice session it would be high, but then it could be low at the next interview. At the first interview (end of Year 1) she rated her commitment as moderate, and made the comment that she was disillusioned about college, and that her Placement (regular work in a Normal School) was boring. During Interview Two she said, *"I'm not sure that I want to teach."*; yet at the end of her Year 2 section she said, *"The section was brilliant. A really down-to-earth Associate. I was respected by the kids."* (Commitment rating (1)). After the Year 3 section she said, *"It was good. I feel able to teach a class ... but I need a break from study and responsibility ... I need time out."*

Katie's description of how she went about studying when at school was similar to that of most students i.e. 'summarizing and memorizing':

> *"I'd summarize my notes then write them from memory."*

She found this process laborious and boring, and this attitude (that study was laborious and boring) persisted throughout her time at college. She consistently saw her 'problem' with respect to study as being motivational rather than methodological. There were numerous references to this effect throughout the series of interviews -- *"I muck around too much,*

always having to stop and make coffee ... I really must pull my finger out ... I know I'm hard to get started ...I've slackened a lot ... I need a break." and so on.

The main features of Katie's ASI profiles were as follows:

Factor Scales: Very high score on Safety-first Approach to learning in Year 1, but this decreased over the years.
An extremely high score on Superficial Approach in Year 1, but again this decreased considerably over time. (T-scores 69, 55 and 44).

Entwistle Scales: Extremely low Deep Approach, but this increased over the three years (T-scores 38, 50 and 57).
Very low Strategic Approach, Use of Evidence and Meaning Orientation, all increasing over time.
High Surface Approach, Globetrotting and Surface-confused scores in Year 1 but decreasing over time.

Katie's descriptions of how she went about various tasks showed some variability. For example, the following is a description she gave of her approach to essay writing in Year 1:

> *"I sat on it for a few weeks, then pulled it out - looked at the questions, chose one I liked, then went to the library and got some books. I sifted through them looking for information - didn't read the whole book. Then I wrote an introduction, typed that out. Then it was just write and type until it was finished.*
> Interviewer: "Did you work to a plan?"
> *"Yeah, I planned it out but I don't always stick to it. The conclusion is the hardest - trying to sum it all up. You've got to be really careful about plagiarism too - we had a*

big lecture on that. I put the person's name who had the bit, then I put it in my own words - that's not plagiarism is it?"

Her understanding of the concept of standard deviation was a little obscure:

"Wow - you're trying to make me think now! Well ... you've got this score, and you've got a normal curve ... the standard deviation is so many points on either side of the mean. I don't know how to say it, but I could draw it! For example, .7 standard deviation is .7 away from the mean ... 34 percent are one standard deviation above the mean."

On the other hand, when it came to something Katie was interested in she would talk fluently and animatedly about it. An essay on the humanistic aproach to teaching was a case in point. She had read A.S. Neill's Summerhill, and found that here was a philosophy of teaching that really appealed. To her, it pointed up so much that she considered was wrong with our own education system. Her favourite subject at college was Physical Education, and her eyes would light up as she described some of her work:

"...it's my main interest - that's my area. We're working with crippled children at the moment and I really enjoy that. We've done dance with them and our production was just great - did you see it?
I've just today finished my first book. I made it myself - 'Physical Education Activities for Crippled Children'. I'm really proud of that ... I did all the research myself."

It is easy to see why statistics seemed to be very barren stuff for Katie.

The main feature of Katie's motivation at college (apart from her enthusiasm for Physical Education), was her real dread of failing. During interviews she often expressed great anxiety about failing some course:

"I've just got a D for this essay. It has really shattered me. That means I'll probably

fail that course. I went to see the lecturer to see if I could do something to make up for it - but all he said was that I should put more effort into the next assignment. But I did try hard for that one, and what if I fail the next one? - I'd be out!"

Factors that Katie said raised and lowered her motivation were:

Raised motivation:	Personal relationships
	Other students
	Section
	Involvement in college activities
Lowered motivation:	Exams and tests
	Some courses and lecturers

Like her commitment to teaching, Katie's aspirations for further study in terms of applying for a fourth year studentship tended to vary from time to time. at her final interview, which was only about two weeks from the end of the year, she said that she definitely wanted to do a fourth year. At that final interview, Katie summed up her three years at college thus;

Year 1. *Pretty average. Socially slow.*

Year 2. *Socially, I got to know people at college a lot better. Section was great.*

Year 3. *Good beginning. Feel washed out now; run down; terrible.*

Was Katie a better learner after three years at college?

Although she passed all her courses, and did well on teaching practice, Katie did not graduate. She withdrew from

college a few days before the graduation ceremony, and did not take up the fourth year studentship that she was offered.

Although the ASI profiles show a definite improvement with respect to Katie's approaches to studying, it is probable that she did not really become a better learner as a result of her college experiences. She maintained an intense dislike of anything remotely abstract or theoretical. She had a poor opinion of her own ability, coupled with a dread of failing.

Circumstances might have been quite different if Katie had been able to enjoy normal student life and not had to bear the responsibility of looking after her dying grandmother in her third year.

Case Study 6: John (Subject code 90)

John was 19 when he came to college, and although older than the average first year student, he did not have a break between leaving school and starting at college. John's difficult start to college on account of his father dying a few days before enrolment has already been described (see p.183).

At school John's method of writing an essay was to take lots of notes, read them, put them together, condense them and present them as his essay. He was not satisfied with this approach, and at the end of the first year he was saying:

> *"I go through my notes, thinking about them and how they could begin to form an argument. Now my problem is trying to cut down on words. My essays are always far too long and over the word limit. If something is important, or seems important, it just has to go in."*

The main features of John's ASI profiles were as follows:

Factor Scales: Consistently high on the Careful Logical Approach to studying; Enthusiasm for Study; Non-confident Approach and the Exploratory-Logical Orientation.
Consistently low on the Disgruntled and Vocational Impulse scales.

Entwistle Scales: Consistently moderate to high on both Deep and Surface Approaches. Consistently high on Intrinsic Motivation; Meaning and Reproducing Orientations. In the first year - very high on Achievement, Surface-confused and Versatile Orientations; Strategic Approach, Achievement Motivation and Comprehension Learning.
Non-academic Orientation and Extrinsic Motivation consistently low.

The tendency for John's ASI scores to be mostly high suggested that a response bias might be operating, and indeed, analysis of his response patterns revealed that over 84 percent of his responses were 'Agree', or, 'Agree strongly'. John obviously had a strong tendency to agree!

At school, John tended to lean heavily on staff for support and encouragement.

> *"I leaned heavily on teachers ..."*
> Interviewer: "Did you get advice on how to go about studying?"
> *"Yes, from the Principal ... from teachers who were family friends ... I think they motivated me more than anything".*

While at teachers college he related well to most of the lecturing staff - not that he ingratiated himself - he was just a very pleasant young man, eager to please and eager to learn.

Teaching was John's first preference for a career, and he

had the highest score of anyone on the EVCS questionnaire. During the interviews, he consistently rated his level of commitment as (1). Teaching practice did nothing to dent John's very idealistic view of teaching. In discussing his Year 2 teaching practice section, which was in a fairly "tough" school, he commented thus:

> *"...it was really excellent ... and challenging in terms of the backgrounds of some of the children. Many were from single-parent families and saw me as a kind of father figure - a new role for me. And to be called 'Mr _____', by the children and the teachers, that was great!"*

John's approach to learning tasks was generally enthusiastic, and he usually attempted to find meaning in the material. In discussing tasks on which he was currently engaged or had recently completed, he usually revealed that he had thought deeply about them. He had a special affinity for theoretical and abstract issues which he loved to discuss with other students or lecturers. In the first year the course he enjoyed most was Issues in N.Z. Education, and in the third year, Sociology of Education. He claimed that he found the theory course Learning and Teaching particularly relevant.

With respect to the application of theory to practice, John said:

> *"I try and apply what I've learned in lectures. I can see what they're getting at and I think to myself - 'you'd better listen, 'cos what they're getting at is going on right before your eyes!'"*

At the end of the first year John gained a B Bursary, and this raised his confidence considerably:

> *"I've lifted my sights ... Maybe I am capable ..."*

From then on, he was very keen to get a fourth year studentship to complete his Bachelor of Education degree.

John claimed the factors that raised and lowered his motivation were:

Raised Motivation:	Teaching Practice
	Encouragement from fellow students and lecturers
	University study
Lowered Motivation:	Some Supportive courses
	Extension courses
	Part-time work

John's enthusiasm was maintained over the three years - in spite of very difficult personal circumstances (such as keeping two part-time jobs going for the whole three-year period). This enthusiasm came through in his summary of his three years at college.

Year 1. *First term: - very hard, thinking of my dad's wish - but a girl-friend came along and things were not so bad.*
The last term: - getting into the swing of things - what a neat life it is to be a student teacher!

Year 2. *First term: anxious to get started - steaming along like no-one's business.*
Second Term: dragging the chain a bit - things a bit slow. Hurrah for section! It came at the right time.
Third term: slow, rather bored. Lost the pace a bit.

Year 3. *Term 1. On a high. The first real university year. Three university courses ... neat one!*

Term 2. A lot of pressure to get tasks completed. Teaching Practice tops.
Term 3. Wow! I've got an S4 Year!

Was John a better learner after three years at college?

John certainly had enthusiasm for learning, and unlike many students, he maintained this enthusiasm throughout his time at college. He was extremely positive about most of his courses and he did try to apply what he had learned at college to the classroom situation. His ASI profiles were remarkably consistent across the years and developmental trends were therefore not evident. The probable response-bias which seemed to operate, detracted from the usefulness of the scales for the purpose of indicating improvement in approaches to learning.

John did not achieve academically to any great degree. After his first year B Bursary, his grades were mainly average, and he graduated in the 'ordinary' category. However, it must be remembered that John held down two part-time jobs throughout his time at college and this must have affected his performance, especially in terms of the amount of time he could give to studying. If John had developed the faculty of critical thinking while at college, one would have little hesitation in suggesting that he did indeed become a better learner and, in the third year interviews, there appeared to be some evidence that this was happening.

General Comment: The most striking feature of these 'pen portraits' is that they emphasise the uniqueness of each student. While this feature is probably enhanced by the fact that only six studies are reported, analysis of the transcripts of the whole interview sample does not detract from this general impression. Each student entered college with a unique set of abilities, experiences, attitudes, motivation and personality characteristics that undoubtedly influenced how he / she

approached studying and learning. Nevertheless, there were also several instances where the case studies seemed to highlight features that could be said to be typical of certain groups of students. The anti-academic stance adopted by three of the case studies, for example, is typical of many of the young people who come to teachers college. Current research suggests that this attitude has its roots in the secondary school. Interviews of pupils in a Waikato secondary school by Jill Mitchell (A Hamilton Teachers College lecturer) revealed that academically inclined students tended to be scorned by other students and labelled derogatively as 'Nerds' (Mitchell, 1989). Harris and Mitchell (1988) in another study in the Waikato found similar attitudes. Bright students who want to be socially accepted by their peers, therefore, might at least want to pretend to be anti-academic. It is also interesting to note that the two Maori students in the case study sample (Lisa and John) were the most enthusiastic about study.

Analysis of the complete set of interview transcripts revealed that several students were like Phillip - keen to achieve, but locked into a surface-level approach to studying which limited their achievement. There were also others like Candy who were intensely idealistic about their chosen vocation, and several who like Mary and Katie were not nearly so enthusiastic about teaching as lecturing staff imagine their students to be.

Finally, the discrepancy between what some students said during interviews and what they indicated through questionnaires invites comment. The greatest discrepancy appeared with the two students who graduated with distinction (Mary and Candy). In both these cases, the ASI profiles indicated that these students were strongly surface learners, yet in the interviews they described meaningful approaches to learning (at least for some subjects). Since it was unlikely that students could fake meaningful approaches, particularly when describing some aspect of their studies in their own words, the question is, why did these students respond to the questionnaire items in the way that they did? Perhaps subconsciously, they were at pains not to

appear as 'Nerds', or perhaps the questionnaire items were ambiguous and open to misinterpretation. This is obviously an area which needs further study.

QUESTION 9	**How do faculty perceive student development, and do their perceptions correspond with student perceptions?**

It will be recalled that the first of the four questions which directed the Phase 2 research design was concerned with obtaining staff views of student development (Chapter 5, p.98). This major question consisted of four subsidiary questions, as reproduced below:

1. From the perspective of the teaching staff:

    1.1 What are the characteristics of successful and unsuccessful students?

    1.2 What qualities are students expected to develop as a result of exposure to their courses?

    1.3 To what extent are these expectations realized?

    1.4 What do individual staff members do in order to bring about the developments they would like to see in students?

Information derived from staff responses to these questions provided the focus for the first part of Research Question 9: <u>How do faculty perceive student development?</u>

The interview protocol and summary of the responses from the 13 staff members interviewed are contained in APPENDICES B4 and B5 respectively. Further information of a quantitative nature was derived from analysis of the Staff Perceptions of Student Development Questionnaire (SPSDQ). Because the items in this questionnaire were also responded to by the students in the Phase Two (cross-sectional) design, that questionnaire also provided the basis for comparing staff and student perceptions which comprised the second part of Research Question 9: Do their perceptions correspond with student perceptions?

Additional information related to this last question was obtained indirectly from comparisons of staff and student responses to interview questions.

1.1 What, then, from the perspective of the teaching staff, were the characteristics of successful and unsuccessful students?

In describing the characteristics of successful and unsuccessful students, staff responses fell into four broad categories. They described academic, attitudinal, motivational and personality characteristics of students.

Successful students were described mainly in terms of academic attributes. They were perceived to have the following qualities:

* Able to relate theory and practice
* Competent use of language and the ability to learn how to learn
* A broad background of general knowledge
* A flexible, open approach to learning
* A questioning, thinking approach to problems

With respect to attitudes, several staff members described the successful students as people who:

* Were flexible and open-minded
* Were willing to give things a go
* Have a positive approach to their courses

A wide range of adjectives were used to describe the personality attributes of successful students. They were variously described as confident, conscientious, responsible, competitive, cooperative, resourceful, creative, persevering and independent.

With respect to motivation, successful students were perceived to be intrinsically motivated, and somehow orientated towards success:

> *"Successful students seem to feed on themselves...the fact that they are successful helps to perpetuate that success."* (Lecturer 5)

> *"I think that these people must have been successful elsewhere."* (Lecturer 8)

Achievement motivation was also mentioned several times -

> *"...there's a certain aggressiveness - a determination to succeed."* (Lecturer 12)

Unsuccessful students were seen to have a closed passive approach to learning:

> *"They want to apply the recipe, but don't know why they are doing it."* (Lecturer 4)

These students were also perceived to lack basic academic skills (particularly in reading and writing), and were unable to relate theory with practice.

Unsuccessful students also have rigid attitudes according to many staff members. For example:

> *"They say, 'Tell me what teaching is and I'll get on with it - but if you want me to experience a whole new psychology of learning then I'm not interested.'"* (Lecturer 9)

These students were also described as being apathetic, or had the attitude that they had nothing further to learn.

In terms of their motivation, unsuccessful students generally lacked commitment and interest; they also tended to attribute their failures to causes outside themselves:

> *"Failure is attributed to causes other than themselves. Lecturers are boring; lectures are boring and not relevant; the kids they have to work with are hopeless; Associate Teachers are useless ..."* (Lecturer 5)

In terms of personality characteristics, unsuccessful students were variously seen as having closed minds, lacking in confidence, were lazy and disorganized.

1.2 What qualities were students expected to develop?

This question was not put directly to the respondents, but their views could be inferred from their descriptions of the 'ideal student'. It was interesting to note that whereas staff tended to describe successful students in terms of academic criteria, in describing the 'ideal student', they invariably stressed personality characteristics and motivation.

About half of the staff members interviewed mentioned <u>enthusiasm</u> as a quality possessed by the ideal student. It was clear, however, that most of these respondents were visualising the student as a <u>future</u> <u>teacher</u> and not necessarily as a current learner. Many staff members also seemed to admire the student who was independent and non-conformist:

> *"The good student is <u>not</u> the one who always follows the rules and does what she is told. The good student is the one who is active in campus politics, who questions what goes on in lectures, and possibly complains about what*

> *goes on in lectures - but not in a negative way. These are the sort of students I find satisfaction in working with, because, these students are interested in what they are doing."* (Lecturer 13)

> *"...the people who don't want to be spoonfed all the way through. They've got a mind of their own, a head on their shoulders, and are willing to think for themselves."* (Lecturer 3)

Other personality attributes mentioned were: open to other views; sensitive and caring; conscientious; industrious; sense of humour; honest.

Motivational attributes mentioned were mostly concerned with intrinsic motivation. The striving for self-actualizing was also commented on frequently with comments such as:

> *"...they keep exploring, keep trying to find out ... a willingness to keep on developing."* (Lecturer 1)

With respect to academic abilities, the quality most frequently mentioned was the adoption of a questioning approach. The ability to integrate across courses, to make considered judgements, and possessing good study skills were all mentioned once.

The attitudinal qualities of the ideal student were similar to those attributed to successful students: preparedness to 'have a go'; flexible and open-minded; being positive and unafraid to ask for assistance.

Personality characteristics of the ideal student seemed to be those that respondents saw as being desirable in a beginning teacher; that is, they tended to see the student as a future teacher rather than as a current learner. For example, the ability to relate to other people, especially children, was the most frequently mentioned characteristic. Leadership skills were also mentioned, e.g.

> *"I rather like the shepherd model. The shepherd doesn't take his flock from the front. He goes behind so as to be careful of the stragglers without stopping the ones in front from going on. The shepherd analogy is not a bad one I think."* (Lecturer 9)

1.3 To what extent are these expectations realized?

Once again, this question was not asked directly, but staff views were inferred from their responses to the following question put to them in the interview: "Do you believe that student approaches to studying changes significantly over the three years at college?" While this question was narrower in scope than the original research question (focussing only on approaches to studying), further information as to the broader development of students was available from staff responses to the Staff Perceptions of Student Development Questionnaire.

From the first source (the interview data), staff appeared equally divided with respect to three views of student development. About one third (4) noted a change towards relativistic reasoning such as was described by Perry (1970). That is, they saw students as becoming less rigid in their thinking, realizing that things are not usually right / wrong or good / bad, and that there may be other legitimate viewpoints:

> *"...students move from recitation of transmitted knowledge to being generators of their own, and they make the adjustment rather well.* (Lecturer 9)

> *"...they - the third years - were not just picking up the crumbs of knowledge that I would ceremoniously dispense. It was more like a group of minds looking at a problem."* (Lecturer 10)

> *"...there's a different perception of what study is. First Years are not ready to question or relate, now, as Third Years they can. Most of the change takes place in the third year."* (Lecturer 3)

Approximately another third of the respondents considered that there was some change in students' approaches to studying, but that they had reservations as to the quality of that change. In the opinion of these staff members, students either (a) learned to conform:

> *"They learn a survival skill: they find out what lecturers want and they give it."* (Lecturer 8)

or (b) became more pragmatic and cynical:

> *"Third years are not concerned with 'pie in the sky' and philosophical ideas about teaching - well perhaps they are - but they are more concerned with practical things like running a classroom. They learn the tricks of the trade, become more cynical and pragmatic."* (Lecturer 13)

> *"They learn to grab anything they think will be useful"* (Lecturer 4)

The remaining third of the staff sample thought that there was either very little change in students' approaches to studying, or, if there was change, it was probably for the worse:

> *"I suspect there's probably not much development at all. They're not much better at putting ideas down on paper."* (Lecturer 1)

> *"I think they might study less. They develop techniques to avoid study ... they are still not independent."* (Lecturer 4)

There were no apparent sex, seniority or subject differences with respect to staff responses. It should be noted, also, that it is difficult to give exact figures because there was some overlapping, e.g. a lecturer stated that students became more pragmatic and cynical, but later said that he thought that writing skills had improved. Even so, the general view of the staff who were interviewed with respect to student studying and learning was not very positive: less than one half of the sample saw students developing in a positive direction.

The Staff Perceptions of Student Development Questionnaire This questionnaire required staff to distribute 20 typical students along a five-point scale for the items which were constructed to represent each of the Factor Scales of the ASI. This was done for first, second and third year students (the procedure was explained in Chapter Four, pp.102-104,106, and the full questionnaire is included in APPENDIX A.4).

Some of the respondents chose not to enter distributions for a class they were not currently teaching. For example, if a lecturer taught only first and third year students during 1987, he / she might decline to do the exercise for second year students, even though it was explained that recent experience with these students (in the previous year) would be acceptable. The result was that there were unequal n's of respondents for each student year. All the respondents (13) taught first year students; 9 taught second year students and 11 currently worked with third years. Thus, to allow for easier interpretation of the data, TABLE C.1 in Appendix C reports the percentages of students in each category. The Chi-square analyses, however, were calculated using the raw frequencies. TABLE 9.1 presents the frequencies and percentages for the items of the SPSDQ that were close to significance (with respect to the difference in distributions from year to year). The Chi-squares and levels of significance are also reported in TABLE 9.1. The following summary treats the items in order of decreasing levels of significance for the differences in year by year distributions.

Item 6 represents the Factor Scale Safety-first Approach to Learning. The significant differences in the distributions made by staff for each year of study suggests that the staff sample generally considered that students became less cautious and more venturesome with respect to their approaches to study over the three year period.

Item 9 represents the Factor Scale Lack of Confidence (the lack of confidence specifically referred to students being tied to a memorizing strategy because they had not the confidence to

TABLE 9.1 Frequencies (and percentages) of students placed by 13 staff members in each of five categories of a five-point scale for six items of the Staff Perceptions of Student Development Questionnaire. Asterisked items have significant Chi-squares.

		FIVE-POINT SCALE				
	YEAR	V.Low 1	2	3	4	V.High 5
ITEM		f (%)	f (%)	f (%)	f (%)	f (%)
2. Open Approach	1	36 (13.8)	71 (27.3)	99 (38.1)	34 (13.1)	20 (7.7)
	2	12 (6.7)	37 (20.6)	81 (45.0)	30 (16.7)	20 (11.1)
	3	19 (8.6)	39 (17.7)	96 (43.6)	37 (16.8)	29 (13.7)
6 * Safety-first	1	14 (5.4)	28 (10.8)	73 (28.1)	73 (28.1)	72 (27.7)
	2	13 (7.2)	30 (16.7)	71 (39.4)	36 (20.4)	30 (16.7)
	3	26 (11.8)	41 (18.6)	68 (30.9)	43 (19.5)	42 (19.1)
8 Super-ficial	1	23 (8.8)	48 (18.5)	82 (31.5)	55 (21.2)	52 (20.0)
	2	19 (10.6)	32 (17.8)	64 (35.6)	34 (18.9)	31 (17.2)
	3	38 (17.3)	50 (22.7)	53 (24.1)	44 (20.0)	35 (15.9)
9 * Lacking conf'ce	1	21 (8.1)	34 (13.1)	76 (29.2)	74 (28.5)	55 (21.2)
	2	17 (9.4)	28 (15.6)	56 (31.1)	41 (22.8)	38 (21.1)
	3	32 (14.5)	49 (22.3)	65 (29.5)	35 (15.9)	39 (17.7)
10 * Thorough -ness	1	46 (17.7)	79 (30.4)	67 (25.8)	44 (16.9)	24 (9.2)
	2	23 (12.8)	40 (22.2)	68 (37.9)	29 (16.1)	20 (11.1)
	3	22 (10.0)	46 (20.9)	78 (35.5)	42 (19.1)	32 (14.5)
11 Initial-explore	1	59 (22.7)	78 (30.0)	69 (26.5)	35 (13.5)	19 (7.3)
	2	29 (16.1)	47 (26.1)	55 (30.6)	32 (17.8)	17 (9.4)
	3	39 (17.8)	52 (23.6)	63 (28.6)	36 (32.2)	30 (13.6)

Item 2	Chi-square =15.13	df=8	p<.06
Item 6	" 28.58	"	p<.001
Item 8	" 15.02	"	p<.06
Item 9	" 20.41	"	p<.01
Item 10	" 19.66	"	p<.02
Item 11	" 11.5	"	p<.20

try other approaches). The staff sample's opinion seemed to be that, over time, students generally gained in confidence to try other strategies.

Item 10 was concerned with the Factor Scale Thoroughness in Study. Staff who responded to the item generally considered

that, over time, students became more thorough in checking that their own and others' conclusions were justified by the evidence.

The distributions from year to year for the items which represented Factor Scales 2 and 8 respectively just failed to reach significance at the .05 level of probability on the Chi-square test. The significance levels of .06 in each case, however, were close enough for the trends to be noted. The general feeling appeared to be that students adopted a more open, questioning approach to learning and became less superficial in their approach over the three years.

The final item in TABLE 9.1 represented the Factor Scale Initial Exploratory Approach to Studying. The trend, though not significant was towards an increase in this strategy over the three years.

In general, then, the responses made by staff to the SPSDQ reveal that staff had a positive view of how students develop with respect to their approaches to studying over their time at college. This is contrary to what the majority of staff seemed to be saying in the interviews. The specificity of the questionnaire items in contrast to the very open-ended, general nature of the interview questions possibly accounts for the discrepancy. It is interesting to note that the items in TABLE 9.1 all represented factors associated with approaches to studying. The remaining items of the SPSDQ (not reported because the distributions were not even close to being significantly different from year to year) were, in the main, items representing the motivational factors (e.g. Enthusiasm for Study, Need for Success and Vocational Impetus)

1.4 What do individual staff members do in order to bring about the developments that they would like to see in students?

The actual question put to staff during the interviews was:

> "What have you actually done, or what would you like to do, in order to help students develop effective study skills over the three years?"

The rider, "or what would you like to do", was attached because some respondents might have felt constricted by factors outside their control, such as administrative structures or regulations. While the interviewer attempted to deal with each part of the question separately, in some cases it became difficult to separate the two. In hindsight, then, it would have been better to have asked the two questions separately.

The things that staff actually did to promote desirable student development fell into two categories: direct instruction and indirect instruction. These are considered below.

(i) Direct Instruction.

One respondent, who was an intake-coordinator for second year students (which means that he had special pastoral and administrative responsibilities for that student intake for their whole time at college), had issued all his students with a study skills booklet at the beginning of their first year. He took particular care to see that each T-group adviser (a staff member with the pastoral responsibility for a group of about 20 students) in his team worked through the booklet with his or her students at the weekly advisory meetings. This particular respondent had also arranged for every T-group in his intake to be taken on a familiarization tour of the library. This was normal practice with respect to first year students, but the provision of a study skills booklet was not.

Another form of direct instruction was course-related. This usually took the form of providing students with guidelines for essay writing (some courses required a specific format with respect to referencing and presentation).

One lecturer, who taught a learning theory course, made special efforts to get her students to apply what they were learning about learning to their own situations. Another lecturer who taught a course on reading, also tried to make the content relevant to the students' own needs and gave them practice in reading for meaning with material appropriate to their level.

(ii) Indirect Instruction.

The most general form of indirect instruction mentioned by respondents was in the form of feedback on assignments. Some staff not only commented on the quality of the student work, but they would point out stylistic alternatives, or give brief instruction on technical aspects such as punctuation. Sometimes a student would be invited to call and see the lecturer in order to discuss some aspect of the work.

The general tenor of classroom instruction was another form of indirect instruction. Several lecturers described how they made attempts to encourage students to become independent learners, to ask questions, to relate material, and to learn in cooperative situations. One lecturer described how he attempted to get students to personalize a particular theory of learning (Generative Learning Theory), thus:

> *"I have to convince them first of all that it is respectable for them to have a different point of view to mine, and so I possibly use case studies or something like that to show that children are very unfazed by telling you their views on some aspect of physics ... children might say that fire is a living thing - and so do I when I'm being poetic, but not when I'm being scientific! - and they said, 'that's neat, we can live with that.' - and they start telling me their conception of the natural world ...*
>
> *It is said, 'Where is the child?', find that and go on from there - not from some arbitrary starting point - and the business of finding where the child is at fascinates these students."* (Lecturer 9)

The question of what staff would like to do in order to assist students to become better learners will not be elaborated upon because it does not bear directly on the research question, but it is of interest to note that:

1. A strong need was expressed for a staff development programme.

2. Several staff were keen to change the administrative structure so that it would be possible for a small group of staff to work more or less exclusively with a proportion of students for the full three year period. It was said that this would allow for greater continuity and would allow a collegial relationship between staff and students to develop (this is actually being trialled by a group of staff and students in 1989).

3. About half of the respondents felt that they needed more time in order to work with students more effectively.

4. Four lecturers expressed the view that some systematic form of continuous study skill development for students was required (i.e. that a study skills booklet issued in the first term of the first year was not sufficient).

Only one lecturer felt that enough was being done already to assist students to develop more effective learning strategies. The over-riding impression gained from the interviews with staff was that they were concerned to become more effective teachers themselves, and that they worked hard to bring about desirable changes in students.

The second part of Research Question 9 was concerned with the degree of correspondence between staff and student perceptions of how students develop over three years.

It has already been described how an attempt was made to

quantify the degree of correspondence by getting students and staff to respond to the same questionnaire items. Also, in Chapter Four it was explained why it was not appropriate to apply statistical analysis to the data from staff and student responses in order to compare them directly (see p.111). It also needs to be kept in mind that only 13 lecturers responded to the questionnaire items of the SPSDQ (approximately 25 percent of the lecturing staff), while the whole student population responded to these items. It is because of these factors that any interpretation of the data presented in TABLES C.3 and C.4 in APPENDIX C must necessarily be very tentative.

The responses made by staff and students to the items of the SPSDQ could be compared in two ways: (a) Chi-square tests could be applied to student responses in the same way as was applied to staff responses in the preceding section of this chapter. This method simply noted the significance of the differences in distributions over years for each item of the scale. (b) Another approach was to lay the distributions made by staff and students for each item side by side, and note, not only differences in trends, but in the direction or strength of the distributions. The trouble with this latter approach was that such differences could only be noted by inspection (for reasons already explained).

(a) TABLE 9.2. presents the items for which an appreciable difference was noted in the frequency patterns over the five-point scale made by students for each year of the cross-sectional phase. Frequencies in the middle category of each item were omitted for the chi-square calculations because of the disproportionately small numbers who responded to the (2) choice on the five-point scale (students were instructed to avoid the (2) option if possible).

Thus, it can be seen from TABLE 9.2, that students generally became more dissatisfied (or disgruntled) with the relevance of some of their courses over the years. The actual item was: 'Some of the subjects I have to study make me wonder if I should be in teacher training.'

TABLE 9.2 Distributions (in frequencies and percentages) made by students over five categories of a five-point scale for four items of the Staff Perceptions of Student Development Questionnaire. Chi-squares and levels of significance are also reported.

		FIVE-POINT SCALE				
	YEAR	V.Low 1	2	3	4	V.High 5
ITEM		f (%)	f (%)	f (%)	f (%)	f (%)
4. Disgruntled	1	33 (24.3)	42 (30.9)	7 (5.1)	33 (24.3)	21 (15.4)
	2	16 (12.3)	40 (30.8)	3 (2.3)	49 (37.7)	22 (16.9)
	3	20 (19.8)	17 (16.8)	4 (4.0)	37 (36.6)	23 (22.8)
11. Initial Explore	1	16 (11.8)	62 (45.6)	12 (8.8)	40 (29.4)	6 (4.4)
	2	11 (8.5)	51 (39.2)	11 (8.5)	52 (40.0)	5 (3.8)
	3	8 (7.9)	39 (38.6)	7 (6.9)	34 (33.7)	13 (12.9)
5. Enthusiasm	1	47 (34.6)	54 (39.7)	15 (11.0)	18 (13.2)	2 (1.5)
	2	31 (23.8)	60 (46.2)	14 (10.8)	22 (16.9)	3 (2.3)
	3	30 (29.7)	35 (34.7)	6 (5.9)	25 (24.8)	5 (5.0)
9. Lacking conf'ce	1	28 (20.6)	42 (30.9)	1 (0.7)	44 (32.4)	21 (15.4)
	2	20 (15.4)	49 (37.7)	4 (3.1)	46 (35.4)	11 (8.5)
	3	28 (27.7)	27 (26.7)	5 (5.0)	34 (33.7)	7 (6.9)

Item 4. Chi-square = 16.71 df=6 $p < .02$
Item 11. " = 12.73 " $p < .05$
Item 5. " = 11.14 " $p < .10$
Item 9. " = 11.49 " $p < .10$

For item 11 - which represented the Factor Scale Initial Exploratory - most first year students thought that they did not rate highly, but, by the third year, opinion was more evenly divided.

Items 5 and 9 related to the Factor Scales Enthusiasm for Study and Non-confident Approach respectively. The non-significant trends were for students to see themselves as being unenthusiastic about study (but third years were more enthusiastic than first or second years), and students generally became more confident about the approach they used over the years. The only item which was common to TABLES 9.1 and 9.2 was

Item 11, where the same trend was noted by students and staff. The shared belief was that students increasingly adopted an initial - exploratory approach over time.

(b) TABLE C.3 in APPENDIX C.3 gives the percentage of students placed in each category of the five-point scale by staff and students for each item of the SPSDQ, and for each year of study. In the absence of any suitable statistical test, it was considered that the simplest way to make differences readily observable was to treat the scales as bi-polar. For student responses this was a fairly simple matter because students had been instructed to avoid the middle category if at all possible. The two categories on either side could be collapsed and thus provide frequencies (and percentages) which could be simply labelled 'High' or 'Low' for any item. The procedure for treating staff responses to these items was not so straightforward because staff did not avoid the middle category of the five-point scale. To create a bi-polar scale, the frequencies in the middle categories were distributed proportionately to either side. Thus, if the frequencies on the high and low sides were in the proportion 2:1, the frequency in the middle category was distributed accordingly. While admittedly very crude, it is argued that since differences could only be noted by inspection anyway, this method had the advantage of making immediately obvious any extreme differences or close similarities in the responses of the two populations. TABLE C.4 in APPENDIX C presents these bi-polar scales for staff and students, and TABLE 9.3 is simply an extract from TABLE C.4 to provide an example for discussion.

It is apparent from TABLE 9.3 that more students were dissatisfied or disgruntled about their courses than staff believed was the case, and also, that students became more disgruntled with each succeeding year of study.

Items about which there seemed to be close agreement in student and staff perceptions are listed below.

TABLE 9.3 Percentage (to nearest whole number) of students categorized as High or Low by students and staff for Item 4 of the SPSDQ, for each year of study.

	STUDENTS		STAFF	
Year	Low	high	Low	High
1	55	40	72	28
2	43	55	66	34
3	36	59	66	34

Item 1. (Represented the factor scale Disorganized and Dilatory). About half of the students in each year thought that they had problems of an organizational nature with respect to study, and this matched the perceptions of the staff sample.

Item 5. (Represented the factor scale Enthusiasm for Study). The majority of students claimed to be unenthusiastic about study, and this corresponded with the staff view. The trend for Year 3 students to be more enthusiastic about studying than the other students which was noted in Chapter Seven was also evident here. What this analysis also adds is that the improvement was from a very low level of enthusiasm in first year students to a moderately low level in third year students.

Item 6. (Represented the factor scale Safety-first). Most students rated themselves as cautious rather than adventuresome with respect to their study strategies, and staff perceptions corresponded with this view. Staff, however, appeared more optimistic and indicated a slight trend towards students becoming more adventurous in the third year.

Item 12. (Represented the factor scale Vocational Impetus). There was close agreement that students were motivated principally by the desire to have a career in teaching.

The remaining eight items all revealed some difference between staff and student perceptions but, because of the tentative nature of the data, only those with differences which were substantial are noted below.

Item 10. (Represented the factor scale Thoroughness in Studying). Staff and students had completely opposing views with respect to this item. The majority of students checked themselves as being careful and thorough in checking that their own and others' conclusions were justified by the evidence, but staff rated students low on this factor (although indicating that some students did improve over the three years).

Item 3. (Representing the factor scale Careful and Logical Approach). In each year, a considerable majority of students rated themselves as high on this scale. The staff view was that students were equally divided, about 50 percent being careful and logical and 50 percent not.

Item 7. (Representing the factor scale Need for Success). Very few students admitted that they were competitive with respect to their peers, but again staff opinion was that they were equally divided.

Item 9. (Represented the factor scale Non-confident Approach). Students were evenly divided with respect to this item, but staff considered that the majority of students lacked confidence in their study methods in Year 1, but that several gained in confidence over the three years.

Item 11. (Represented the Initial - exploratory Approach to studying). This item produced the most startling difference in perceptions. Staff thought that about 35 percent of the students were high on this factor in Year 1, and this was matched by the actual student distributions, but then staff considered that 90 percent of students were high on this item in the third year while students themselves appeared equally divided.

In summary, staff and student perceptions corresponded rather well with respect to items which represented mainly motivational factors, but there were considerable differences with respect to those representing some of the approaches to studying. Staff appeared to be generally optimistic (or was it wishful thinking?) and pictured trends in positive directions. Student distributions revealed remarkable consistency from year to year.

With respect to the general tenor of the interviews, there appeared to be one major difference in staff - student perceptions. This was with respect to the qualities of a good student. Staff were asked this question directly, and it has been described how staff seemed to appreciate students who were independent thinkers and who would challenge and debate. Students were not asked the question directly, but it was very apparent from the interviews that students generally thought that lecturers did not appreciate these qualities. They thought that the questioning student was generally 'put down' and considered a nuisance, and that lecturers hated being challenged. Students tended to think that to get on and to be liked by lecturers, students had to conform and just give the lecturers what they wanted. In writing essays, for example, it was best to support what they presumed was the lecturer's own viewpoint.

CHAPTER TEN

SUMMARY AND CONCLUSIONS

The present study began in response to a need expressed by several workers in the field for in-depth longitudinal research into learning at the tertiary level. The main purpose of the research was to investigate how students went about studying and learning in the natural setting of a New Zealand teachers college. In particular, the researcher was interested in the strategies adopted by students when faced with their normal learning tasks. What determined the strategies students used? How effective were these strategies? Did they change with time and experience? Could they be improved? The research hoped to provide some answers to these questions, as well as questions related to the general development of students at the tertiary level.

These research questions were pursued by means of a two-phase research design. Phase 1 was a longitudinal study over a three year period of one student intake. It was unfortunate that the research was initiated at a time when teachers colleges in New Zealand were faced with the first of several severe cuts in student numbers, and the size of the main research sample had to be smaller than hoped for. This predicated some special problems with factor analysis work on the study questionnaire employed. Again, the main sample was more homogeneous in terms of age than was desirable. Phase 2 of the study was designed to help offset these problems. It involved a cross-sectional study of three student populations, as well as a comparison of student and staff perceptions of students' study and learning skills. Both quantitative and qualitative research methodologies were employed in this second phase of the research.

The instruments employed in the Phase 1 research design were:

(i) The Expressed Vocational Commitment Scale (Ramsay, 1978).

(ii) The State-Trait Anxiety Inventory (Spielberger et al., 1968).

(iii) The Approaches to Studying Inventory (Entwistle and Ramsden, 1983).

Factor analysis of the Approaches to Studying Inventory (ASI) suggested groupings of items into alternative sub-scales. Both these alternative Factor scales and the scales proposed by the Entwistle and Ramsden (simply called the Entwistle scales) were used in the study.

For the Phase 2 research design special items were constructed to represent each of the Factor scales of the ASI. These items were inserted into the original ASI and they also formed the basis for a Staff Perceptions of Student Development Questionnaire. Thus staff and students responded to the same set of items which permitted a quantitative comparison of staff and student perceptions with respect to students' study and learning skills.

The Major Findings

1. Aproaches to Studying and Learning.

Three aspects of students approaches to studying and learning were investigated:

(1) The stability of the approach
(2) The developmental trends
(3) The relationship between approaches to learning and academic success.

(1) The stability of the approaches to studying and learning. The ASI sub-scales Deep Approach and Surface Approach

showed the greatest variability from year to year. This was possibly because these approaches were the ones more readily influenced by the nature of the task and by factors such as student interest in the subject. The scales which were most stable over time were those which seemed to reflect learning styles, personality syndromes or simply acquired habit (e.g. Disorganized Study and Superficial Approach). Interview results indicated that students who claimed to use the same approach to different tasks invariably described surface-level strategies. Students who varied their approach from task to task described deep learning strategies for some of the tasks - in other words, they appeared to be versatile in their approach.

(2) Developmental trends in approaches to studying and learning. Students in the Phase 1 (longitudinal) design revealed a different overall trend from those in the cross-sectional population. In Phase 1 the trend was towards an increase in surface-level strategies with a corresponding decrease in deep-level approaches. But students in the cross-sectional phase indicated trends in the opposite direction. These findings were of particular interest because one of the main objectives of the study was to see whether New Zealand students would describe similar patterns of development to the Australian students who were the subjects in a study by Watkins and Hattie (1983). The findings were equivocal, therefore, with respect to that question, the Phase 1 results being in line with the Australian research, and the Phase 2 results being contrary to that research. Contradictory findings, however, have also emerged from within Australia. In a replication of the Watkins and Hattie (1983) study, Watkins (1986) found that students at the Australian National University who completed their courses tended to change to less superficial learning strategies. In other words they appeared to be similar to the students in the cross-sectional samples of the present study. The important question nevertheless remains: Why were there differences between the longitudinal and cross-sectional samples in the present study, and between the two populations of students studied by David Watkins? A clear answer to that question would obviously have

implications for tertiary teaching. At the present time there are no clear answers, but perhaps there are significant leads.

One factor which could account for the differences in the present study was the change in the college programme which was initiated in 1984. This change, the result of an intensive review of the college preservice programme, was designed to do several things to improve student attitudes and learning. The first year courses became more school based so that theoretical studies could be seen to have relevance (an intensive school-based programme in the first term could help students find out earlier whether teaching was really 'for them'; special courses were set up with the aim of integrating curriculum practice with theories of learning; a study skills adviser, appointed in 1986 on a part time basis, not only provided group sessions on study skills but assisted students on an individual basis; and finally, in 1986 and following years, a systematic attempt was made to promote study skills by the introduction of a study skills booklet in the first term of Year 1.

The age factor was also obviously important. In the Phase 2 research design, older students in each year of study tended to have higher scores on the scales related to a deep approach to learning. This is in line with the findings of the Watkins and Hattie (1983) research and also with the replication of that study by Watkins (1986). Age, however, must be considered along with experience. Older first year students, for example, could well have had previous tertiary experience. Inspection of the student files revealed that this was indeed the case. Over 50 percent of the students who were aged 21 years or over had had previous experience of university study. University experience alone, however, cannot explain the discrepancy in the learning trends of the longitudinal and cross-sectional populations. If this were the case, then the third year students in the longitudinal sample should have developed positively with respect to meaningful approaches to learning. Yet, by the end of their

third year almost all of these students had completed two thirds of a Bachelor of Education degree, and had become less inclined to adopt deep learning approaches. It is impossible to tell, therefore, how much the improvement in student approaches to studying and attitudes towards learning that appeared in the 1987 population was due to the increased maturity of these students, or to the new college programme. It is most likely that a combination of these factors contributed to the change.

(3) Relationship between approaches to studying and academic performance. The findings from previous research that students who are disorganized and who have negative attitudes towards studying do less well academically was confirmed in this study. It was also found that the top ten percent of students (in terms of final academic grade) tended to adopt deep learning strategies. The general pattern appeared to be that students who performed best academically were deep learners (although there was evidence of at least two of these students adopting a strategic approach), and were intrinsically motivated. Students at the next level tended to be the strivers (adopting surface-level or strategic approaches and being highly anxious and achievement motivated). The remaining 60 percent of the students had significantly higher scores on Surface Approach and lower scores on Deep Approach (these results stem from the Phase 1 research design only).

2. Student Motivation.

While some researchers (e.g. Biggs, 1979, 1987) see motivation as an integral component of any approach to studying, in the present research the two constructs were treated separately. This was not to deny that they are almost inseparably entwined, but was an attempt to look at the relationship without any predetermined notion of its structures.

The relationship between approaches to studying and

motivation that emerged with respect to the ASI did indeed support previous findings. A deep approach to learning was associated with intrinsic motivation and achievement motivation (as measured on the Achievement Orientation scale). A surface approach was associated with fear of failing and achievement motivation. Lack of confidence and the adoption of non-risk taking approach (mainly because of fear of failing) were associated positively with disorganized, dilatory and superficial approaches.

Other motivational factors which did not evolve from the ASI were anxiety and commitment to teaching. Anxiety was related to a surface approach to studying and to achievement motivation. Commitment to teaching was not strongly related to any approach to studying. This was not surprising, because approximately 80 percent of the longitudinal sample were either highly or very highly committed. There was variation in expressed commitment, but it was generally small.

Motivational variables were also explored by means of the interviews with 32 students from the longitudinal population. The findings here are described briefly below:

Need Achievement. The level of need achievement was almost impossible to gauge from the replies to interview questions. This was because of a considerable anti-academic bias that existed among the students in the particular population used. This bias, which may not have been entirely conscious, made students reluctant to admit that they were competitive (other than at sports), or to agree that getting good grades was important. Only a close analysis of the interview transcripts revealed the inconsistencies that existed between what students said and what they actually did. One result of this finding is that the student scores on the Achievement Motivation or Need for Success scales are probably much lower than the real level of these factors.

Academic Goals. For some students having the academic goals of getting a teaching diploma or a fourth year studentship were

strong incentives to work hard. Again, however, there was little relationship between having an academic goal and any particular approach to studying.

Interest. Interest in a topic or subject as a motivational factor seemed to be positively correlated with a deep approach to studying, but the relationship revealed some inconsistencies. Some students (and by the end of the third year, most students) put most of their time and effort into subjects that they had difficulty with or which presented them with the highest workload. These students tended, because of pressure of time, to adopt surface level strategies even for subjects that did interest them. The Surface-confused group was distinguished by the fact that they tended consistently to put most time and effort into subjects in which they were interested, and tended thereby to adopt meaningful approaches for these subjects, but surface or reproducing approaches for subjects that did not interest them.

Stress. Stress was a factor which strongly influenced students' approaches to studying, and a strong relationship appeared between the degree of stress and scores on the Surface-confused scale of the ASI. Stress could result in students appearing disorganized, highly anxious and being unable to concentrate on their studies - all being symptoms of the surface-confused student. One of the great surprises (to this researcher) was the number of students who were suffering from fairly high levels of stress. The interview sample may give a false indication of this because a considerable proportion of this group (38 percent) were selected for their high surface-confused scores. Nevertheless, by simply extrapolating from the second random group used in the study, it is likely that at least a third of the student intake in their first year experienced stress sufficient to affect their study adversely.

Motivation and academic performance. There were few significant relationships between the motivational variables of

the ASI and academic performance. In the final year, Achievement Orientation and Need for Success correlated positively with final academic grade. The Disgruntled and Negative Attitude scales correlated negatively with academic grade. Students who graduated with distinction were less disgruntled than other students, and students who graduated with commendation tended to have significantly higher Achievement Motivation scores than other students.

The longitudinal and cross-sectional populations revealed motivational trends in line with the trends which appeared for their approaches to studying. The longitudinal sample increased in the Extrinsic Motivation, Negative Attitudes, Disgruntled and Vocational Impetus scales. The cross-sectional population increased in Enthusiasm for Study (but the increase was only from a very low level to a moderately low level).

3. Learning Style

The present research focussed primarily on the learning styles and pathologies proposed by Pask (1977). The main finding was that these styles tended to be consistent over time and across similar tasks. This general consistency of style was supported by data from the interviews. In describing how they went about essay writing, for example, many students revealed operation learning or comprehension learning styles, and those students who described their approach to essay writing on more than one occasion, invariably described the same general approach.

Many of the tasks on which students were typically engaged seemed to elicit a particular style. Lesson planning and report writing in particular, appeared to require the sequencing and focussing on discrete parts which form the essence of the operation learning style. There was also a suggestion that the ability to see the end result before planning the details (which

seems necessary for the writing of performance objectives) was a skill which particularly suited the comprehension learning style.

A trend which appeared for both research populations was a decrease in the Improvidence pathology sub-scales over the three years. Students became less inclined to be over-cautious and relying on details over the years. There was a suggestion that this was related to age but, as has been mentioned earlier, it is difficult to separate out the effects due to maturity and extent of academic experience.

There was some support for Pask's suggestion that versatile learners would tend to be more successful. Students who had high scores on the versatile scale of the ASI did tend to do better academically in the long run, but the degree of superiority was only marginally significant. The only pathology which seemed to inhibit learning was globetrotting. That scale correlated negatively with the final academic grade, and the group which graduated with distinction revealed a decreasing trend in globetrotting across the three years while the commendation and ordinary groups increased their level of globetrotting. In the first year, some students in the Surface-confused group were seen to be trying unsuccessfully to adopt deep-learning approaches to some tasks, and their confusion and frustration seemed to afford a good example of globetrotting in action.

4. General Development.

The following summary features aspects of student development that have not already been reviewed in the preceding sections of this final chapter.

Results from the interviews with a section of the Phase 1 population highlighted the fact that there were many patterns of development. For example:

- Some students were highly committed to their chosen vocation of teaching and were enthusiastic about studying and learning throughout the three years.

- Some students were equally committed to teaching but adopted an anti-theoretical, anti-academic attitude.

- Some students changed in a positive direction with respect to their approaches to studying.

- Some students were not particularly committed to teaching, but nevertheless achieved well over the years.

- Other students were not particularly committed to teaching and did not achieve well. These tended to be the people with negative attitudes towards studying and who generally adopted superficial and disorganized approaches.

- Some students were enthusiastic about study, but did not achieve well because they had a strongly developed, inflexible surface-learning approach.

- Some students who were deep learners at entry to college had to become versatile in order to survive.

All except one of the students in the interview sample were happy to talk about how they studied and about their college experiences generally. Many acknowledged that they had become more aware of how they studied and felt that in some ways they had benefitted from participating in the interviews.

Students generally perceived their own development as learners in positive terms, even though the two student populations (the longitudinal and cross-sectional samples) were different with respect to general maturity and the type of college programme within which they were operating. Extrapolating from the interview sample, almost 74 percent of the students in the longitudinal population thought that they had

changed for the better with respect to their study strategies from Year 1 to Year 3. This seemed contrary to the general picture which emerged from the ASI data. The discrepancy is explained when it is realized that student ideas of changing for the better were mostly concerned with being more experienced, better organized and working harder. Only 16.6 percent of the interview group spontaneously described a change towards more meaningful approaches to learning.

Psychometric data only was available for the cross-sectional population of students. As well, the cross-sectional design has obvious weaknesses in revealing developmental trends, the most obvious being that the population for each year of the study was different with the result that the between year variance is considerably higher. Nevertheless, the fact that positive trends in student development emerged has already been discussed. The interesting feature was whether staff generally concurred with with this perceived view of development. When responding to the SPSDQ, generally staff did see students improving over the years with respect to their approaches to studying and learning, but not with respect to motivational variables such as Enthusiasm for Study, Need for Success and the level of dissatisfaction with courses. A strange feature was that staff opinion differed in response to the open question about student development which was asked in the first interview. Indeed, only about one third of those interviewed thought that students improved with respect to their approaches to learning over the three years. The remainder thought that there was little change and, if anything, students only became 'smarter' at meeting requirements. What version of staff opinion do we believe? The researcher's inclination is to accept the interview data. This seemed to reflect what staff were really thinking, whereas the responses to the SPSDQ seemed more to reflect what staff thought ought to happen. This, however, is only a hunch, and it can easily be argued that because the questions in the questionnaire were more specific, they ought to be more accurate.

In one or two areas there appeared to be wide differences in

the perceptions of students and staff. Students thought that they were more thorough in study, more careful and logical and more confident than staff perceived them to be. The question arises, therefore, whether staff are honestly communicating with students with respect to these factors, or, whether students are actively resisting what staff are trying to tell them. Students also rated themselves lower on Need for Success (a scale which really referred to academic competitiveness) than staff considered them to be. The very low rating students gave themselves on Enthusiasm for Study really gives some cause for concern if the expression is genuine. People who are going to be teachers ought to be enthusiastic about studying and learning if they are going to develop positive attitudes in their own students.

Student and staff opinion as to what constitutes a good student also appeared to differ. Staff professed to enjoy working with students who were prepared to challenge and debate: students considered that staff really liked the students who were pliable and who readily conformed. The truth perhaps lies somewhere in the middle. Perhaps staff behaviour does not always match their beliefs, and perhaps some students try to rationalize non-participation.

Significance of the Findings

While the research findings have implications principally for learning and teaching at the tertiary level, some were also relevant for learning and studying at secondary schools.

Secondary School Study.

The advice on studying that students had received when they were at secondary school tended to emphasise certain skills and

procedures such as setting schedules, summarizing, organizing, note-taking, practice on old exam papers or quizzes, and using memory aids such as mnemonics. Only one of the students in the interview sample had experience with a study skills booklet which, from its description, was probably S.W.O.T. (Study Without Tears) produced by the N.Z.C.E.R. (Professionally produced study skills booklets like S.W.O.T. or its Australian counterpart S.H.E.I.K. tend also to emphasise the aspects of studying described above.)

The fact that the considerable majority of students were surface learners when they entered college, possibly reflects the emphasis put on these study strategies (outlined above) by schools. This emphasis is not necessarily a bad thing, but it needs to be tempered by teaching which also enhances deep learning approaches. Such skills as relating ideas, using analogies, putting learning into one's own words, integration with previous knowledge, applying the learning in practical situations, brainstorming and cooperative problem-solving activities are all practices which might enhance deep-level learning strategies. Some of the suggestions with respect to promoting meta-learning discussed in the following section could also be used in the senior forms at school.

Secondary school staff also have a role to play in promoting academic study as a respectable, worthwhile and desirable pursuit. The anti-academic bias encountered among college students in the present study was quite disturbing and, as mentioned previously, there is evidence that this attitude is quite prevalent in secondary schools. It is possible that the attitudes expressed at school simply mirror societal attitudes, and it is a tall order to expect schools to change these. It is, however, a matter serious enough for the nation's well-being and progress for it to be considered by those who are concerned with values education and curriculum planning.

Tertiary Study.

(1) Approaches to learning and Studying. Most students at entry to college were surface learners. The question must be, therefore, what can the teaching staff do about it? Should they attempt to match instruction strategies to the learning strategies of the majority of the students? Should they attempt to persuade, or otherwise influence, students to change their approach in studying to more meaningful approaches? The answer is "Yes" to both questions because they are not mutually exclusive. While Aptitude Treatment Interaction (Cronbach and Snow, 1977) is notoriously difficult to unravel at the tertiary level, it does not make sense to teach in a way that is counter-productive. The relatively high number of students who appeared to be dissatisfied with some of their courses, and the increase in negative attitudes towards studying are probably symptomatic of mismatch in teaching style and student learning strategies.

Is it possible to change student strategies? Unquestionably, some students in the present research did change their strategies in positive directions. What remains unclear are the factors that brought about such changes. Why did some students change and others did not? While there needs to be more research in this area, work with the students in the present study did seem to indicate that motivational rather than cognitive factors were the catalysts for change.

Biggs (1987, p.110) proposed a two stage model of intervention in which students' meta-learning capability is the starting point in implementing change. At the lowest level, Biggs suggests teaching strategies that help the student to survive. Emphasis on the basic study skills and on highly structured instructional methods such as mastery learning, are procedures which help to reduce fear of failing and build up confidence. Once the student is at the next level and has high meta-learning capabilities, instruction should be more non-directive and emphasis placed on the gaining of high levels of

transfer. The key to such a scheme is obviously the ability to assist students to make the switch from one level to another. According to Biggs, the counsellor (or teacher) must first induce some awareness in students of what they are doing, and why they are doing it. The counsellor or teacher should get students to see why scheduling is important, and why adopting a deeper approach is better, even though the surface approach might seem to be successful.

During the course of the present study the researcher did, in fact, attempt an informal type of intervention within the framework of a course in educational psychology in which he happened to be teaching. The students completed the abbreviated version of the ASI (Entwistle, 1981), and produced their own profiles on the major learning and motivational factors. Students were then given the definitions and brief descriptors of the various scale titles, and were asked to reflect on whether, in their view, the pictures portrayed of them as learners on the profile sheets were accurate. If they were not accurate, they were instructed to first check the arithmetic (Scales were in standard scores), and then to check how they had checked each item in the scale they disagreed with. The next stage was for students to meet in small groups to compare and discuss their profiles and interpret them with respect to their actual learning strategies. This exercise was successful in heightening awareness, but to what extent it actually influenced studying strategies is not known.

Intervention can also take the form of giving students choices with respect to how they would prefer to be evaluated (e.g. by essay writing or by short-answer test), and how they would prefer to be taught. Intervention of this type has been planned by the present researcher and a team of his colleagues with respect to a course in educational psychology being taught in 1989. Students will be offered a choice in the way they wish to be taught by selecting one of three strands through the course. The strands will differ in the amount of structure and direction given. At one end of the scale will be the traditional

teaching by lecture and tutorial with set assignments. At the other end students may contract to do individual in-depth study on any topic on the course outline. In the latter case students will be guided and supervised on an individual basis by a team member who particularly likes to teach in this way.

The above examples represent an attempt to get learners to reflect on their own study strategies, and to encourage lecturers to adapt teaching styles to learners' needs (even in areas that are traditionally taught by the lecture method).

2. Motivation. The fact that intrinsic motivation is closely linked to deep learning approaches has obvious significance for teachers at all levels. No-one can make a student intrinsically motivated, but there is little doubt that such motivation is greatly influenced by teachers. When students discussed subjects they liked or were most interested in, they invariably mentioned some teacher who had enthused this liking or interest. The message for tertiary teachers may be stating the obvious: It does matter how you present your material, how you relate to students and how enthusiastic you appear to be about your subject.

The research suggested that stress played an important role in influencing student approaches to studying. That a considerable number of students in any random population may be suffering from stress at any one time, emphasises the importance of an effective counselling system at a tertiary institution. The problem, however, lies in identifying such students. Unless the present researcher had specifically asked about crisis, it is unlikely that stress situations listed in this research would have been made known. Periodic interviews of an informal nature between students and staff to discuss progress and / or problems would provide a structure. But getting the parties to see the necessity and value of such a system would possibly be problematic.

3. Learning Style. As mentioned above, the present research focussed almost entirely on the Pask constructs with respect to learning styles. It needs to be kept in mind, however, that these styles stem from only two approaches to learning, the serialist and holist approaches. It may be assumed that other styles would naturally emerge from the other approaches to learning which were discussed in Chapter Six. FIGURE 10.1 presents a model for viewing the relationship between approaches to learning and learning styles. Consistency of approach, without special regard to the nature of the task will tend to lead to the development of specific styles (for example, comprehension learning if a consistent holist approach is adopted). These styles are labelled (A) in FIGURE 10.1. When applied inappropriately, these styles can result in incomplete learning because of the specific pathologies associated with each style. This of course is the Pask model, but it is assumed that it should also apply to styles other than comprehension and operation learning. Controlled variability of approaches to different tasks is the hallmark of a versatile style (labelled (B) in FIGURE 10.1). With a versatile style the learner in effect has developed a repertoire of approaches to learning over which he or she has control. From FIGURE 10.1 it can also be seen that internal factors, external factors and learning style may combine to influence the way in which a learner will approach a particular learning task. The model simply presents the features related to approaches to learning of which tertiary teachers ought to be aware. In particular, teachers should be aware that:

* Particular tasks are liable to evoke specific approaches to learning.

* The actual approach adopted by a learner should be, but may not necessarily be, congruent with the cognitive requirements of the task.

* Pathologies of learning can be the result of continued application of a style without regard to the nature of the task.

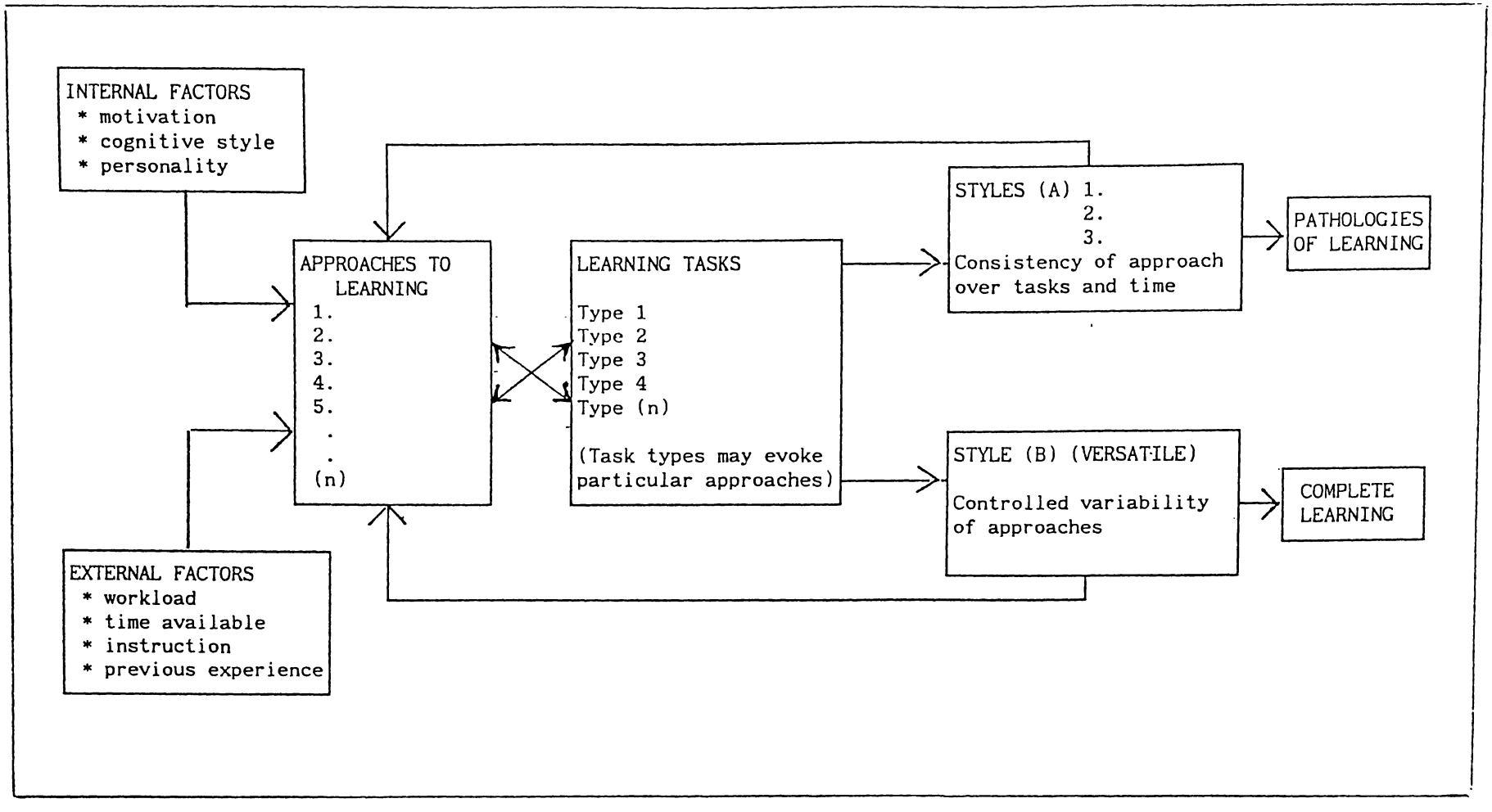

FIGURE 10.1 A model of the relationship between Approaches to Learning and Learning Styles

Tertiary teachers should be able to recognize the presence of a pathology and, by appropriate feedback, help the learner to overcome it.

The results of the present research suggested that versatility was something that students tended to bring to college with them. There was little evidence of versatility developing as a result of students' experiences at college. Research into the origins of versatility should perhaps be focussed on students in the high school setting.

4. General Development. College staff who were interviewed seemed only minimally aware of stages in cognitive development in the students with whom they worked. Aspects of development such as Perry's first few stages, which are concerned with an absolutist attitude towards knowledge, were seen as general characteristics of students rather than as stages of development. It is revealing that only four out of the thirteen staff interviewed perceived students as becoming more questioning and active with respect to learning in their third year. There is obviously a need for staff development in this area, a point which is discussed in the next section.

Teaching staff also need to be aware that in certain critical areas, their perceptions of student development may be quite different from the students' own perceptions. This suggests the need for careful and accurate feedback about expected standards, and about the appropriateness of the approaches and processes that students have applied to particular assignments.

5. Staff Development. The need for some form of staff development programme which was expressed during the staff interviews had also been made known to the college administration, with the result that one staff member has now been given responsibility (with a small time allowance) for the

implementation of such a programme for college staff. Also, at the University of Waikato, a staff development programme has been in operation for some time, and there are current proposals to introduce a teaching diploma specifically for university teachers. These moves are obviously encouraging. The findings of the present and similar research, which have implications for tertiary teaching and learning, should be considered by those responsible for the planning of such programmes (there has been a tendency for staff development activities at the teachers college to concentrate on introducing staff to new educational technology and to establishing procedures for visiting and assessing students' school practice). Some specific suggestions for staff development programmes arising from the present study (and from the review of the literature) are listed below:

(i) Awareness of the following aspects of learning and teaching at the tertiary level:

- Many students do not become better learners as a result of their experiences in college (or university) courses, and this has possibly more to do with how courses are taught and evaluated than with the intelligence or application of the students.

- Teaching styles and learning styles may not be congruent, in which case students may become dissatisfied and negative about their course.

- Teaching styles need not be inflexible. It is important for teaching staff to have a repertoire of teaching skills and methods.

- Student motivation is not simply a 'given'. It is an interaction of environmental and personal factors which sometimes may be beyond the control of the student.

(ii) Awareness of the importance of meta-cognition. Not only is it important for students to learn to reflect on their own learning processes, it is equally important for staff to reflect on their own teaching.

(iii) Explore methods of helping students to make the switch from:

- Absolutist to relativistic reasoning.

- Non-metalearning capability to full metalearning capability.

(iv) Finally, staff should be encouraged to engage in mini-research of their own in the area of effective teaching, and be given opportunities to share their findings with colleagues.

6. Student Development Programmes. Several of the staff who were interviewed expressed the view that the issue of a study skills booklet in the first term of the first year was not sufficient to help students become better learners. They felt that some on-going programme of study skill development should be introduced. It is the view of the present researcher that any higher study skills programme should be course-related. Staff would need to develop guidelines as to the expected outcomes with respect to student study and learning skills which any given course should help to develop. Individual departments within an institution could well use the Course Perception Questionnaire (Entwistle and Ramsden, 1983) to provide student feedback as to the quality of teaching within a department.

Comments: the Research Methodology and suggestions for Future Research

The Phase 1 Research Design. The quantitative orientation of this phase was problematic for two reasons:

(1) The sample size was rather small which was undesirable for the purposes of factor analysis, and also meant that one could be less confident about accepting differences which appeared to be statistically significant.

(2) Some of the sub-scales of the ASI appeared to have rather low levels of internal consistency.

The second phase of the research was introduced to help overcome the first problem. With respect to the second problem it appears that, in spite of the years of research which has gone into its construction, there is still need for some refinements to the ASI. A few items are ambiguous and some of them do not apply well to institutions other than universities. Indeed, it may be appropriate now for the ASI to be modified slightly to make it more applicable for other institutions. More research could also be done on the forming of sub-scales through factor analysis.

Despite the problem of the small n associated with the factor analysis of the Phase 1 data, the Factor scales which emerged did suggest further dimensions of approaches to studying which seemed to have particular relevance for the present study. For example, Enthusiasm for Study and Vocational Impetus were more specific and useful than the more generalized constructs of Internal and External Motivation. Again, the Initial-exploratory approach seemed to describe an approach to learning which was fairly common (students began their study with a wide-ranging holist strategy, but then reverted to a more logical analytic approach once they had mapped out the parameters of the task). Yet this approach does not appear in the Entwistle scales. And

Lack of Confidence (leading to the adoption of a surface approach) and Thoroughness in Study, were also scales which had a specificity which was appealing in the context of a teachers college.

On the other hand, some of the Factor scales were so close to the Entwistle scales in the composition of their items that they did not really add any new dimension (for example, the Disorganized and Dilatory and Need for Success scales were very similar to Disorganized Study and Fear of Failure).

One minor criticism of the ASI as applied to the present study, then, is that because it was designed as a very general scale which could be used across departments and even institutions, it loses some of its power when applied to institutions which are more restrictive with respect to the scope of the courses offered.

There were no particular methodological problems associated with the qualitative aspect of the Phase One design. The fact that interaction with an interviewer can influence the opinions and attitudes of some of the students in the sample is an unavoidable aspect of qualitative research. The important thing is for the researcher to be aware of this effect and attempt to take account of it.

The Phase 2 Research Design. The reasons for initiating the second phase of the research has already been outlined (see pp. 96-97), and in terms of these purposes the design was adequate. In retrospect, however, it would have been desirable to have controlled for previous academic experience, and also to have obtained measures of academic attainment at the end of 1987.
Some staff members did have difficulty with the SPSDQ in terms of its length. Once the researcher was aware of this, the approach adopted was to get the respondent to complete the section for different years with a break of at least a few hours between each section. This helped the respondent to focus on each year

independently of the other years, and also made the task less tedious. The staff interviews generally went very well, but a larger sample would have given more confidence about generality for the findings.

Further Research. There is still an urgent need for further longitudinal research into learning in the tertiary sector. The research base is still very meagre and, in some cases, still tends to be very broad in scope. For example, the Watkins and Hattie (1983) research focussed on several departments within a single university, and the Entwistle and Ramsden (1983) study was involved with several departments across many universities. This broad sweep is very necessary, especially in the early phases of researching the topic. But the need now is for more studies like the present one, focussing on a single purpose institution, or on a single department within a university. There is a need also for both qualitative and quantitative approaches to data gathering. Some researchers have specific skills and aptitudes for working with the qualitative methodology, and others have particular strengths in psychometric approaches. It would be unusual for a single researcher to have strengths in both methodologies. However, the answer may well lie in the adoption of a team approach.

There is also a need for interactive research in tertiary classrooms such as has been applied in school classrooms in recent years. One may think, for example, of such developments as interaction analysis, clinical supervision (in particular that of a collegial nature), self-analysis and self-evaluation of teaching, and student-lecturer consultation on teaching and course effectiveness (see the recent Handbook on Research in Teacher Education, Wittrock, 1986).

On a more specific level there is a need to explore further the maturity-experience issue. This might be done, for example, by research such as the Phase 2 design in the present study, but with age and previous tertiary experience being more carefully

controlled. If age does turn out to be an important variable, there needs then to be research to discover just what aspects of approaches to learning do change with increasing maturity.

In the present research gender was not considered as a variable because there were relatively few males in the research samples. Although previous research has indicated that gender may be an important variable, unfortunately it is often confounded by the fact that the sexes tend to choose different types of courses (the high imbalance of males to females in teachers colleges is an example). The whole area of gender differences in approaches to learning is in need of further research.

Finally, there is the crucial matter of examining learning style, study strategies and academic achievement as these relate to tertiary students who come from minority ethnic groups. Affirmative action to provide equality of opportunity is official policy in most tertiary institutions today, yet much more needs to be known about the specific learning needs of these students. An interesting development at Hamilton Teachers College in 1988 was the constitution of a 'Whanau' group. This consisted of a T-group composed of bi-lingual students, predominantly Maori, who for the first two years are tutored by mainly Maori staff. Initial results from the first year were very encouraging in terms of a reduction in the drop out rate, increased commitment and good academic achievement of the students involved. Such developments need to be carefully monitored to discover what the 'ingredients' of such success are, and whether these ingredients may be transferable to other groups.

Concluding Remarks

It is plain that some form of tertiary learning experience will soon become the norm rather than the exception for school

leavers, and is also becoming increasingly commonplace for people in the workforce who wish to undertake some form of re-training. Enrolments at tertiary institutions are increasing each year and expenditure on the tertiary sector is claiming an increasing share of Education funding. The need to improve the quality of teaching and learning at the tertiary level is, therefore, of primary importance - not only to meet the needs of individuals and communities, but also in terms of economic and efficient use of resources.

It is disappointing, therefore, that the general public, the politicians and (surprisingly) some of the main teacher organizations themselves, appear to underestimate the importance of research into teaching and learning. In the several reports on education that have been presented to the New Zealand Government during 1987 and 1988 (The Scott Report, the Picot Report with the official response 'Tomorrows Schools', and the Hawke Report, the emphasis has been on achieving improvements in teaching through reforming administrative structures and funding procedures, and by addressing issues such as equity and accountability. Important as these issues are, it can be argued that the quality of learning and teaching will not improve until teachers know more about the factors which promote quality learning in students, and have the ability themselves to apply this knowledge in their teaching situations. It is hoped that the present research may make a small contribution to the achievement of such a goal for tertiary education.