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APPROACHES TO LEARNING IN UNIVERSITIES AND CAEs

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Introduction
Given the context of enforced amalgamations between some universities and CAEs, the question of the existence of real differences between the two sectors in terms of academic ethos, function, and impact on students, is particularly pertinent.

The characteristics typical of Australian colleges and universities are summarised in the CTEC Report for the 1982-4 Triennium.[1] This general pattern was established in the sixties, following the Martin Report,[2] in which advanced education and university functions were defined and allocated to the two different sectors. In North America, on the other hand, the advanced education function is in effect shared between the universities and the equivalent of TAFE. Now that CAEs have grown well beyond their original remit to the point where they duplicate some university functions, it is worth asking if they implement these functions any differently from universities. If such differences do exist, there would be obvious implications, for example, for allocating teaching responsibilities in advanced education or university sectors of amalgamated institutions.

Functions of universities and colleges
Essentially, universities are discipline oriented. Their major function is to promote the study of a discipline in depth; to extend that discipline through research; to teach both the reasons for and the fruits of that research; and to train others in the ways appropriate to researching that discipline. Courses are designed to build successively on each other. Staff are appointed and promoted for their expertise in a discipline, in adding to that discipline through their own research, and in teaching and otherwise publishing from their expertise. The government of universities, and the protection to academics accorded by tenure and academic freedom, make sense only in that context: staff need protection to carry out their research, and to publicise their findings, to allay the fear of sanctions if their findings are unpalatable to the government or to other established interests. Professional training in areas that require an in-depth, enquiring, orientation arose as a natural extension of the university ethos.

Colleges of advanced education are vocationally oriented. Their major function is to mount courses that supply a community need for tertiary trained professionals, the demand for which may change with market forces. Consequently, courses are monitored in each state by a higher education board, or its equivalent, and college governance is designed to be responsive to ministerial influence. Courses are designed to make a suitable package for the profession in question; subject units are not studied for their intrinsic value. Staff are appointed for their teaching ability and their professional experience; they are not required to undertake research, and with some notable exceptions, few do so.

Collis and Biggs[3] have analysed the matriculation requirements, sequencing of courses, degree structures, and teaching and examining procedures of universities and colleges in terms of their SOLO Taxonomy, and argue that the university structures are higher up the taxonomy and make more complex and higher level cognitive demands on students than do CAE structures. Biggs[4] compared the motivational patterns and learning strategies used by college and university students and found that students conformed to these expectations. College students were more pragmatically motivated, and more likely to use a strategy involving the rote reproduction of selected parts of their coursework, while university students were more intrinsically motivated and more likely to read widely around coursework in order to deepen their understanding of content. Organised study skills were related to average and above average functioning in both university and college students, but excellent performance was related to organised study skills in CAE students only; excellent university students were not so much organised as highly intrinsically motivated. Achievement motivation was actually higher in CAE students only; excellent university students were not so much organised as highly intrinsically motivated. Achievement motivation was actually higher in CAE students in the first year, but it then rapidly declined and by third year was well below that of university students; an organised approach to study likewise declined from first to third year in CAE students but remained high and stable in university students. In general, college students were five times more likely to claim that they were dissatisfied with their performance. These findings were least marked in Arts and Science, and strongest in Education.

In this paper, we look at differences between college and university students in what have been termed deep and surface approaches to learning.

Approaches to Learning
The distinction between meaningful and rote learning is an old and familiar one: it underlies a rather broader distinction — between deep and surface approaches to learning — that is applied to the kind of learning undertaken by tertiary students.[5]

Following are some aspects of these approaches:

Learning quality
A deep approach implies that the student deliberately attempts to make learning as meaningful as possible, that he or she is intrinsically interested in the subject matter, purposeful and organised in studies, prepared to read beyond the set references and to relate what is being read about or lectured about to previous relevant knowledge, to search for analogies and applications, and so on.

A surface approach involves the interaction by the student to learn the necessary minimum, with as little effort as possible, consistent with sufficient marks to achieve his or her purpose. This is accomplished by restricting learning to what is judged to be essential (e.g. "in the exam") and then to reproduce that as accurately as possible, or in a way thought to be approved ("giving the examiner what is wanted"). Also included in the surface approach is a concentration on detail and fact, rather than the attempt to see "the big picture".

Situation-dependence
Some learning environments tend to elicit a deep, and others a surface, approach. Didactic teaching, emphasis on accurate recall of trivia, a heavy emphasis on final examinations in an anxiety-arousing context, and the lack of opportunity of pursuing particular subjects in depth, are some characteristics of tertiary teaching that have been associated with a surface approach. Such teaching alerts the student to the importance of "getting by", which then duly becomes the intention. A student may adopt a deep approach to the major subject, and a surface approach to the subjects that are unimportant except as fillers for the degree pattern; or a student may adopt a deep approach only towards those aspects of the major subject of interest; or he or she may adopt a deep approach only when "in the mood", which may not be often.

Individual differences
A student's approach to a particular learning episode is not, however, entirely attributable to the immediate teaching environment. Students have preferences for one or the other approach, and tend to emphasise that preference across different learning episodes and even different subjects.[6] These preferences are partly due to motivational factors — what a student in general **wants** from his or her studies (a piece of paper, the satisfaction of curiosity, an ego-trip on high marks; any or all of these) — but also to intellectual and cognitive ones. To use the deep approach students need to be: intelligent, already knowledgeable in the area, able to concentrate for long periods without being easily distracted, able to organise themselves and their resources planfully, and so on. Some students are not capable of, or interested in, meeting some or most of these requirements. However, it is possible to help students change from a surface to a deep approach, given appropriate conditions.[7]

Desirability
It seems almost unnecessary to say that the deep approach appears to be more academically desirable. The evidence bears this out very strongly. The deep approach leads to better learning, whether "better" is defined in terms of complexity of outcome,[8] satisfaction,[9] self-rated performance in comparison with peers,[9] or examination results.[10] On the other hand, to the student concerned, a surface approach may be the more desirable if it achieves personal goals with minimal pain, regrettable though others might deem such an approach to be. This example emphasises that to change a student's study behaviour it will be necessary first to try to get him or her to re-order priorities. A second and more positive sense in which a surface approach may be useful is where accurate reproduction of facts and details is academically important, as it is in most undergraduate science courses;[11] as will be seen below, university science students do indeed tend to utilise both deep and surface approaches. Ideally, then, students should have recourse to both strategies, and the wit to judge when which is the more approapriate.

The Present Study
Responses from over 2,000 students in fourteen tertiary institutions were collected to obtain norms for the *Study Process Questionnaire* (SPQ).[12] Respondents were necessarily volunteers, with a wastage of about 60%; fortunately, however, the wastage rate was the same in universities and CAE's so comparisons between them are valid. Complete details of the sampling and administration may be obtained elsewhere.[13]

Deep and surface level approaches were obtained from the SPQ scale scores. This instrument normally yields six scale scores: instrumental motivation (M1), intrinsic motivation (M2), and achievement motivation (M3); reproducing strategy (S1), meaning strategy (S2), and organising strategy (S3). When these scores are factor-analysed two factors emerge, identifiable as deep and surface:

Table 1
Principal components analysis, with varimax rotation of SPQ scale scores of 2,141 college and university students.

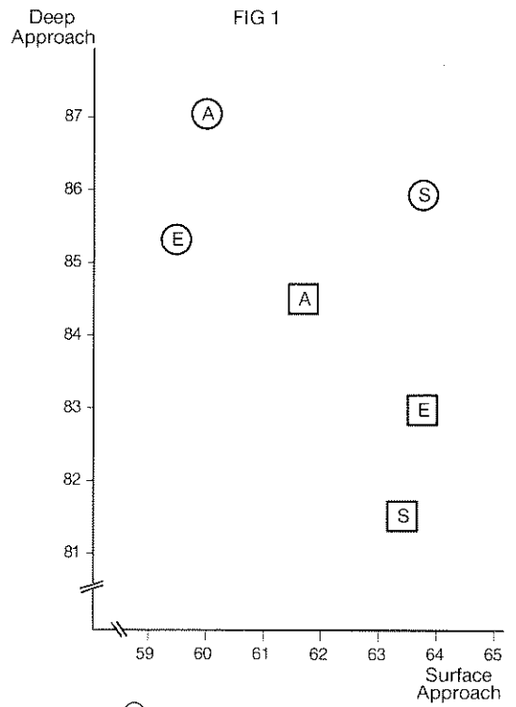
	Factor	
	Deep	Surface
Instrumental Motivation	.01	.80
Intrinsic Motivation	.79	-.13
Achievement Motivation	.52	.54
Reproducing Strategy	-.17	.81
Meaning Strategy	.86	-.13
Organising Strategy	.73	.14
Percentage Variance	37%	27%

In obtaining deep and surface scores, we decided to give each significant factor loading a weighting of unity because of convenience and because this will be in keeping with projected use (the correlation between factor scores and unitary weight scores is .94). Thus:

Deep approach = *intrinsic motivation + meaning strategy + achievement motivation + organising strategy.*

Surface approach = *instrumental motivation + reproducing strategy + achievement motivation*

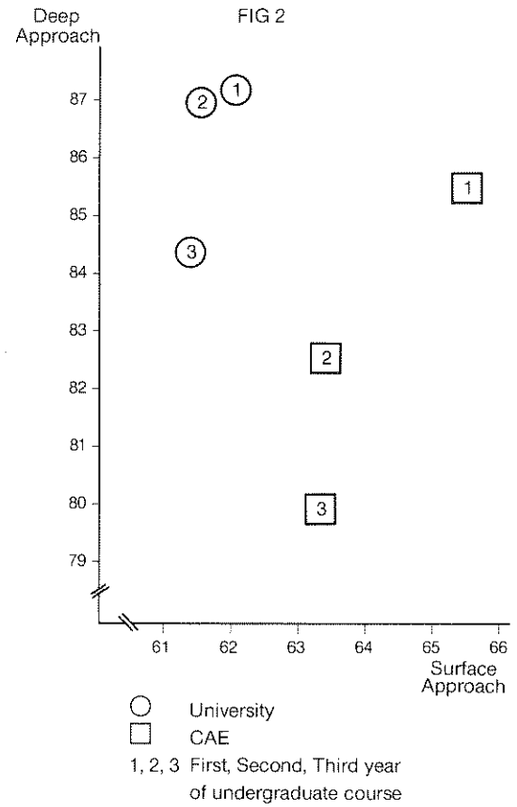
Results
In general, universities students tended to be higher on deep, and lower on surface; while CAE students tended to be lower on deep and higher on surface. This finding is, however, equivocal because there are strong faculty differences on the surface approach, and the faculty mix differed between colleges and universities. The data are therefore presented first by faculty (Figure 1). It should be noted that an analysis of variance showed reliable differences between institutions on the deep approach, but no faculty difference; institution and faculty effects, as well as their intereaction, were all highly significant on surface. This picture is presented in Figure 1.



University and CAE Faculties/Schools on Deep and Surface Approaches

In the university sector, students from all faculties are high on deep approach, with Science students also scoring high on surface. In the college sector, students from all faculties are lower on deep, with Education and Science students high on surface. The interesting switch here is for Education students, who not only drop on deep, as do Arts and Science students, but who quite drastically increase on surface. This finding has important implications that are addressed later.

Figure 2 shows a similar analysis for year of study.



University and CAE Undergraduate Course on Deep and Surface Approaches

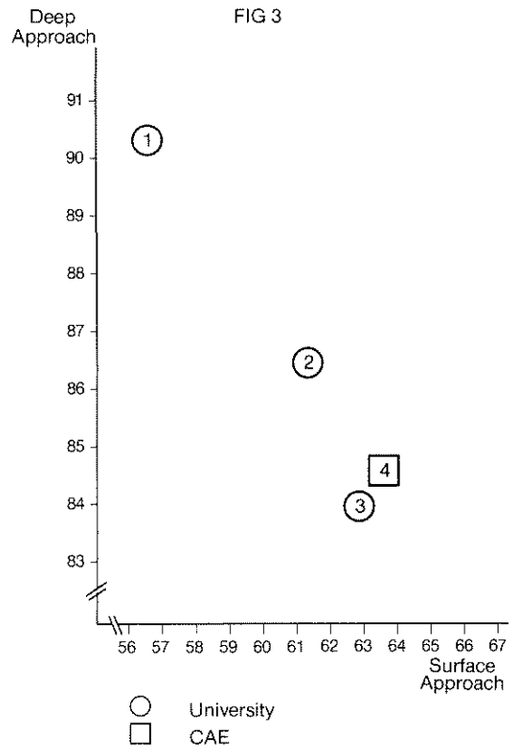
There are strong institutional differences on both deep and surface, and strong year effects on deep, but none on surface. The interaction between year and institution is not significant on either deep or surface. The institution effects are clear, and similar to those in Figure 1. The year effect on deep is interesting and counterintuitive. The third year students are lower on deep than first and second years.

Even in universities, students are not more oriented towards a deep approach by their final year than in the first year, but rather the contrary; this is the more surprising given the degree of attrition that has taken place, with the more likely retention of students with a deep approach. Possibly this reflects a cynicism that is felt towards the middle of the final year, when students' main thoughts are to get out and into the work force, apart from the minority who will be staying on for higher degree work. Alternatively, a number of highly idealistic, though not terribly adaptive, students might have been eliminated through exams and assignment pressures over the first two years of study.

In the remaining results the data refer to the faculties and programmes of individual institutions. Only those institutions are retained where numbers are sufficient to be meaningful statistically. The institutions are referred to by code number, to preserve anonymity. The same numbering is preserved through all figures.

Arts

FIG 3

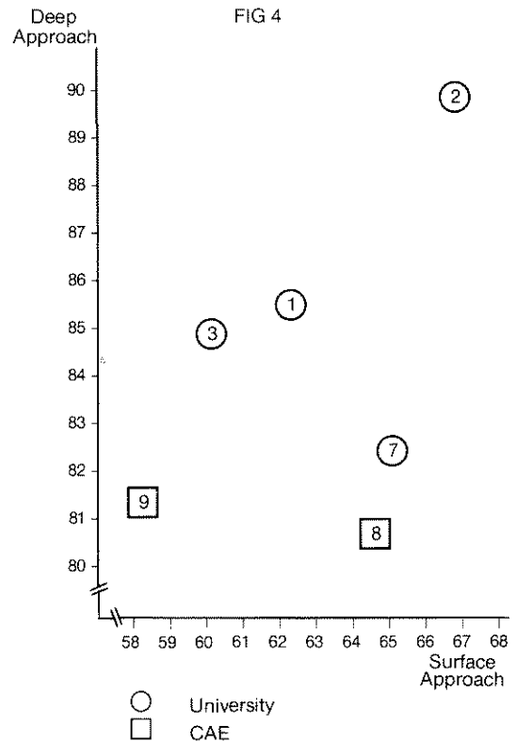


Deep and Surface approach mean scores for Arts students in particular institutions

The positions of three universities and one CAE are plotted. Students from one university (1) stand out as high on deep and low on surface; students from the remaining institutions form a cluster. It should be pointed out that CAE Arts students were enrolled in courses in Fine Arts, Drama and the like.

Science

FIG 4



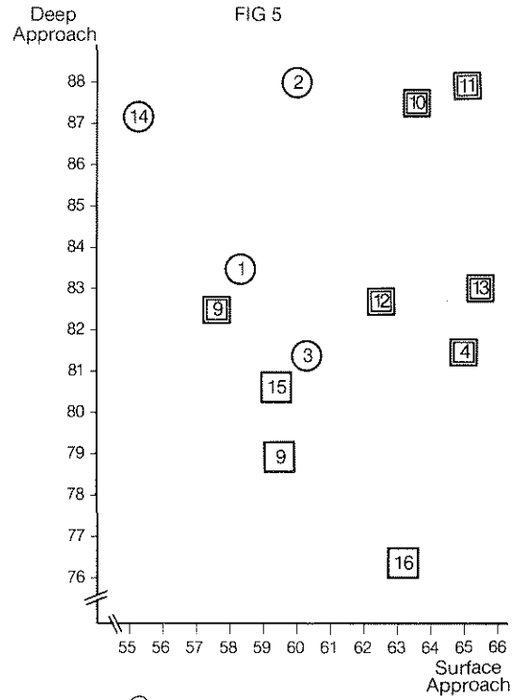
Deep and Surface approach mean scores for Science students in particular institutions

Students from one university (2) are high on both deep and surface, compared to the others, with students from two CAEs falling lowest on deep (9, 8). There is a middle band of students from five institutions on deep, but they show a spread on surface, with students from one university (3) being the lowest on surface.

Education

This faculty is perhaps the most interesting with respect to institutional differences. The picture is clouded, however, because of the preponderance of concurrent (Dip.Teach./B.Ed.) courses falling in the CAE sector, and end-on (Dip.Ed.) programmes in the university sector. These two types of programme are therefore depicted separately (concurrent are double-edged in Figure 5; end-on, single-edged).

FIG 5



Deep and Surface approach mean scores for Education students in end-on and concurrent programmes in particular institutions

Unfortunately there were insufficient numbers to compare the two types of programme within the one institution, so strong conclusions cannot be drawn about the effects of type of programme. However, some general observations may be made.

Students from all the universities scored relatively low on the surface approach with students from six CAEs exceeding the universities on the surface score. One CAE with a concurrent programme (9) scored low on surface and moderately on deep. Three CAE end-on programmes were low on deep (15, 9, 11) and one university (3). Two concurrent CAEs have now merged (10, 11) and are now one programme; these two institutions were as high as the universities on deep, but also high on surface. However, 11 also offered an end-on programme, the students of which scored the lowest of any on deep. While several universities offer concurrent programmes, unfortunately none figured in the present sample in sufficient numbers to enable a useful comparison.

As a matter of interest, it might be pointed out that in Figure 5, two institutions, a CAE (concurrent) and a university (end-on), are currently billed for amalgamation. Individual *t*-tests were conducted on deep and surface approaches in these two institutions, and the university students were significantly higher than the CAE students on deep, and significantly lower on surface.

Implications and Conclusions

In view of the larger numbers involved, the most stable generalisations should be drawn from the analyses comparing institution types, rather than individual institutions, as represented particularly in Figure 1.

It is clear that there are highly significant differences between CAEs and universities in the extent to which students report using deep and surface approaches to their learning. Given the functions, aims, staffing and course structures within each type of institution, these differences are in line with expectations. With faculty held constant, universities appear to develop, or attract, students with a deep approach to learning, and CAE students with a surface approach.

Such a pattern is not necessarily inappropriate. A deep approach to learning is important in many professions, particularly where the student plans to become involved in research. However, it may well be that surface learning in CAEs is adequate at the pre-service stage of professional preparation. A deep approach may follow when the "smorgasbord" of courses at the CAE becomes integrated with practical experience.[14] Such a hope underlies the thinking behind the "3 + E + 1" degree structure currently being adopted in many CAEs (the numbers refer to years of fulltime study, and the "E" for professional experience). There is, however, no

evidence that this deepening of approach with experience actually does take place. If anything, the evidence is the other way; the "socialisation" of teachers begins when, as freshly qualified graduates, they enter their first staff room and are told to "forget that academic nonsense; you're in the real world now."[15]

Alternatively, it might be argued that a deep approach is unnecessary in some professional practice. In the case of CAE science gradates, for example, many would be heading for a "hands on" career in agriculture and industry, where the emphasis would be on the application of existing knowledge and techniques in fairly standard settings: the need is to know the broad area well enough to keep things going. Indeed, some industrialists have complained about the deep approach displayed by university graduates: they ask too many questions, don't know enough about the details of the immediate context, and want to try out new ways of doing things rather than sticking with the system as it exists in the present firm.[16] In short, many employers require a surface rather than a deep approach.

It is Education that gives rise to most concern, where the difference between university and college sectors is most marked. While there are some CAE students in concurrent programmes who score reasonably well on the deep approach, none do in end-on programmes, and almost all CAE students are high on surface, whether end-on or concurrent.

These data, and those of the earlier study,[3] are of particular relevance when considering the recommendations of two fairly recent Committees on teacher education in NSW,[17] which, if implemented, would effectively restrict the preparation of teachers to the advanced education sector. A likely result of this would appear to be that the bulk of teachers entering high schools by the late 1980s would be likely to be uninterested in their subject matter, prone to use reproductive, short-term learning strategies, and dissatisfied and disillusioned with their own learning experiences as students.

It is hard to imagine a teacher with a preference for the surface approach teaching in a manner that is likely to stimulate a deep approach in his or her students. Given, too, that deep or surface learning strategies are acquired at least as early as high school, and possibly even earlier[18], the decision to locate teacher preparation in this or that sector could have resounding effects on the development of deep or surface approaches in students. Such a decision should surely be made on education grounds, not industrial or political ones.

The same point applies to enforced amalgamations between universities and colleges. It is difficult to conceive how any effective amalgamation could result in anything but a slide from the top left of our figures to the bottom right; i.e. from deep to surface approaches, given the diminution of resources and consequent staff freezes, and given too, that most amalgamations have been conducted in an industrial atmosphere with guarantees preventing retrenchment. Such a situation can only mean that staff, within and across the advanced education and university sectors, will have to "retrain"; their teaching loads will increase; their involvement in research will inevitably decline.

These data certainly do not encourage much optimism about the likely effects of university-CAE mergers. They do, however, act to define a goal for such mergers: if amalgamations are to proceed, efforts must be made to keep students functioning at a deep level, where that is indicated as both academically and professionally desirable, as it surely is in the case of Education. It is to be hoped that the decision-makers involved in making the best of this very bad job will make their decisions on academic grounds rather than on those giving preeminence to industrial and political considerations, or to personal empire-building. Thus, one alternative, since universities are currently encouraging a deeper approach to learning, is that the university sector should, for educational reasons, and wherever appropriate, teach undergraduate (UG1) and postgraduate awards leaving UG2 and UG3 awards to the advanced education sector. If that is not to be the case, then academics from both types of institution should work to promote a deep approach to learning, regardless of which staff do the actual teaching. It remains to be seen, however, whether industrial and political factors will not in the event prove to be those used in decision-making.

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