

A LONGITUDINAL STUDY OF THE LEARNING
PROCESSES OF TERTIARY STUDENTS*

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ABSTRACT

A longitudinal study of 540 college students using the 'Approaches to Studying Inventory' provided little evidence that students' learning processes became deeper during the course of their tertiary studies. This is despite many of the most disillusioned of the original sample having withdrawn from their studies or not responding to the follow-up survey. Contrary to predictions, the changes that did occur in approaches to learning were independent of the faculty and the age of the students.

In these days of increased public accountability and restricted government spending on higher education there is a need for tertiary institutions to demonstrate the value of a university education. Although there has been considerable research in this area, the findings are such that some educators have questioned whether students do in fact benefit from exposure to tertiary teaching (McLeish, 1976).

Many of the U.S. studies into the impact of higher education have focussed on the personality development of the student. For example, a massive longitudinal study involving some 200,000 students from over 300 post secondary institutions attributed the following effects to a college education: increased social and academic self-esteem; decreased conservatism; increased hedonism; decreased interest in business; and decreased religiousness (Astin, 1977).

There is also evidence that a university degree is useful for avoiding the dole queue. Yet, most students and professors (and probably the population in general) still see the primary aim of college as providing students with the opportunity to acquire both the specialist competencies of their discipline and the general ability to think critically and independently (Percy and Salter, 1976).

Evidence of the impact of tertiary education on intellectual growth is even less convincing, however. One method of investigating this phenomena has been to use cognitive tests such as those developed by the American College Testing Program (ACT) or student grades as evidence of cognitive outcomes. However, both faculty and students tend to see grades as a motivating force rather than as a valid indicator of what the student has learnt from the course (Astin, 1974). The use of admission tests such as the ACT as indicators of cognitive learning outcomes has also been seriously questioned (Dumont and Troelstrup, 1981). But there is little doubt that the weight of evidence using such indicators "is that, on the average, students make gains in substantive knowledge during the college years" (Bowen, 1977, p.68).

Another problem with these and other tests of cognitive outcomes is that they tend to be based on a quantitative conception of learning - that is, learning is seen in terms of 'how much' or 'how fast'. Yet most academics see a qualitative element such as increased 'rational' and 'critical' thinking as an important outcome of a college education.

There are only two well-known longitudinal studies of college student intellectual development from this 'qualitative' perspective (Heath, 1964; Perry, 1970). Both investigations concluded that during the course of tertiary studies most students come to adopt a more relativistic conception of learning and to accept responsibility for their own learning. Unfortunately both studies are based on small numbers of students from elite U.S. colleges conducted about twenty years ago. Both rely heavily on subjective judgements and do not relate their findings to any evidence of student learning. There must be grave doubts therefore about the generality and validity of these findings.

* An extended version of this paper is available from the first author on request.

THE STUDY

The results of longitudinal research recently completed by the writers have provided considerable evidence on the way students' learning processes change as they progress through their studies at the Australian National University (ANU).

The study compared the learning processes of students who were in their first year of study at ANU in 1980 with those of these same students in 1982. A structured questionnaire, the 'Approaches to Studying Inventory' (ASI) (Ramsden and Entwistle, 1981) was utilised to assess the students' learning processes. The sixteen subscales of this inventory, which are grouped into four orientations, are listed in Table I. Psychometric investigations and intensive interviews conducted by the writer have supported the validity of this measuring instrument with ANU students (cf. Watkins, 1983a).

The first stage survey was completed by 540 students. Statistical analysis indicated significant differences in these first year students' learning processes according to age and faculty (Watkins, 1982). Mature age students, who represented about 40 per cent of the sample, were apparently more likely to adopt deep level approaches to study (which involves critical analysis and the seeking of relationships rather than superficial strategies relying on rote learning) than were recent school leavers. Arts students, rather than those enrolled in Economics or Science, were more likely to claim that they utilised a deep level approach.

Of the original sample of 540, 370 were still enrolled at ANU at the time of the follow-up study over two years later - these students were then nearing the end of their third and in many cases final year of tertiary study. The follow-up survey itself was completed by 244 students (a 66 per cent response rate).

RESEARCH HYPOTHESES

The major hypotheses of this study were as follows:

- (1) The students who withdrew from ANU would have poorer, more superficial study methods and/or would be less satisfied with ANU and less motivated to study than those who persisted;
- (2) There will be a tendency for students to change towards a deeper level of processing. This is because as their studies become more complex and their knowledge of the subject matter increased a deeper level of processing would be required;
- (3) The students will tend to exhibit fewer pathologies of learning. Those students who have poor learning strategies would need to change their approach if they were to survive at ANU;
- (4) Change in students' learning processes would be related to the faculty and age of the student. As students become more familiar with the paradigm of their discipline the faculty differences found in first year are likely to become more accentuated (cf. Kuhn, 1962). It is the younger students who would need to change more to the requirements of the senior tertiary courses.

RESULTS AND DISCUSSION

The mean learning process subscale scores from the initial testing with withdrawers, persisting non-respondents, and persisting respondents and from the follow-up testing for the latter group are shown in Table I.

Multivariate analysis indicated that the students' learning processes did tend to change over the course of their tertiary studies but that the differences that did occur were independent of age and faculty (see Table II). There was little evidence that the students' processes became deeper and, in addition, more students expressed disillusionment with their studies. At least, there was a tendency for less emphasis on rote-learning and a decrease in the pathology of globetrotting (i.e. jumping to conclusions without sufficient evidence).

Preliminary analysis suggested that, as predicted, the students who withdrew from their studies may have had less appropriate study methods and less favourable attitudes toward their work than those who persisted in their studies. However, by considering the responses of the 'persisting non-respondents' in the analysis, it was shown that the differences were not simply a persistence vs withdrawal matter - the persisting students who did not respond on the second

TABLE I
Mean learning process subscale scores from first testing of withdrawers
and persisting-non-respondents and both testings of persisting-respondents.

	Withdrawers (n=179)	Persisting non-respondents (n=116)	Persisting respondents	
			1st year (n=234)	3rd year (n=234)
<u>Approaches to Studying</u>				
<u>Inventory Subscales</u>				
<u>Meaning Orientation</u>				
Deep approach	11.23	11.12	11.41	11.06
Inter-relating ideas	11.01	10.70	10.50	10.76
Use of evidence	10.11	9.68	9.74	9.67
Intrinsic motivation	9.23	9.32	9.79	9.55
<u>Reproducing Orientation</u>				
Surface approach	12.64	12.47	11.97	11.99
Syllabus-boundedness	7.91	7.70	7.77	7.59
Fear of failure	5.91	6.05	5.47	5.95
Extrinsic motivation	5.84	6.55	6.63	5.64
<u>Achievement Orientation</u>				
Strategic approach	9.68	10.13	10.44	10.90
Disorganised study methods	10.28	10.69	8.61	8.86
Negative attitudes to studying	6.35	5.77	5.18	5.76
Achievement motivation	7.30	7.97	8.13	7.98
<u>Holistic Orientation</u>				
Comprehension learning	9.40	9.76	8.68	8.89
Globetrotting	7.44	7.97	7.04	6.97
Operation learning	9.91	10.21	10.35	10.15
Improvidence	7.11	6.77	6.91	6.88

occasion reported similar levels of dissatisfaction with ANU as those who dropped-out. This illustrates the possible bias in follow-up samples and the care that must be taken if valid conclusions are to be reached on the basis of longitudinal data (see also Nielsen, Moos and Lee, 1978).

TABLE II
Summary of repeated measures MANOVA on ASI subscales.

Effects	F	p
Main effect	4.29	<.01
Sex	1.51	ns
Age	0.94	ns
Faculty	1.12	ns
Sex x age	0.82	ns
Sex x faculty	1.06	ns
Age x faculty	0.90	ns
Sex x age x faculty	0.70	ns

CONCLUSIONS

Overall this study provided little evidence that these students' learning processes improved (i.e. became deeper) during the course of tertiary study at this University. This is particularly disturbing when it is remembered that many of the most disillusioned had already withdrawn from their studies or did not respond on the second occasion. Student comments indicated that one reason for this unfavourable outcome is the students' perceptions that deep level learning strategies are not necessary to satisfy examination requirements at ANU. This latter attitude is certainly justified by the low correlations between depth of processing and grades at this University reported in earlier studies at ANU (Watkins, 1982; 1983a). Unfortunately superficial learning strategies are likely to lead to a low quality of learning outcome (Watkins, 1983b). However, at least there is some hope that it may be possible to evoke greater depth of learning if ANU lecturers can demonstrate to the students that quality of learning will be reflected by the tertiary grades they award.

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