

Mature Students in Higher Education: II. An investigation of approaches to studying and academic performance

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ABSTRACT Mature students are often said to be deficient in study skills, but a recent literature review by Richardson concluded that they tended to exhibit more desirable approaches to learning. Using a shortened form of the Approaches to Studying Inventory, a comparison between 38 mature and 60 non-mature students taking the same course found indeed that the mature students obtained significantly higher scores on meaning orientation, and that they also tended to produce lower scores on reproducing orientation. In addition, in terms of both their persistence and their attainment, the subsequent academic performance of the mature students on their degree courses was at least as good as that of the non-mature students.

Introduction

In a previous paper (Richardson, 1994), I called into question the widely held belief that mature students tend to lack the basic skills needed for effective studying in higher education. On the basis of a review of the findings obtained using inventories and questionnaires on study processes, I concluded (a) that mature students were rather more likely than younger students to adopt a deep approach or a meaning orientation towards their academic work, and (b) that they were conversely less likely than younger students to adopt a surface approach or a reproducing orientation. These hypotheses were prompted by findings which had been obtained using three different instruments: the Study Processes Questionnaire (see Watkins & Hattie, 1981; Biggs, 1985, 1987, pp. 55–58); the Inventory of Learning Processes (see Watkins & Hattie, 1981); and the Approaches to Studying Inventory (see Watkins, 1982, 1983; Harper & Kember, 1986).

Nevertheless, I also argued that these findings could only be taken as indicative, since they were subject to either or both of two different forms of sampling bias. The first was that several studies had achieved a response rate that was rather less than 100%, particularly those that had relied on postal surveys. Since it is known that people who reply to such surveys differ systematically in their approaches to studying from those who do not (see Watkins & Hattie, 1985), the apparent effects of age might have resulted from differences in the response rates of younger and older students. The second form of bias is that some studies combined data from students taking degrees in different academic disciplines. Since it is also

known that approaches to studying vary systematically between subject areas (see Entwistle & Ramsden, 1983, pp. 181–184; Harper & Kember, 1986), the apparent effects of age might have resulted from the distribution of mature students across different subjects.

It follows from this that effects of age upon approaches to studying in higher education would be more convincing if they were obtained in a sample of students on the same course whose response rate approached 100%. The investigation to be described in this paper attempted to achieve this. It also sought to answer the question raised by Marton (1976) of 'whether qualitative variation in thinking between different age-groups ... can be described in similar terms' (p. 41). This can be addressed by seeing whether equivalent solutions emerge from factor analyses of questionnaire responses produced by mature students and their younger counterparts, but no previous report has presented such an analysis. Research carried out on students following courses with the Open University (Morgan *et al.*, 1980; Clennell, 1987, 1990) has shown that this population yields similar solutions to those produced by students at other British universities when factor analyses are conducted upon their scores on the 16 subscales of the Approaches to Studying Inventory (ASI). However these researchers assumed the integrity of the subscales of the ASI and did not question whether the constituent structure of the subscales themselves could be reconstructed from students' responses to the 64 individual items of that instrument.

In fact, when Entwistle & Ramsden (1983, pp. 50–52) attempted to reconstruct the original subscales in this way from the responses of 2208 university students, the analysis 'produced few identifiable groupings of items' (p. 51). They suggested that the separation of the 64 items into 16 distinct subscales 'could not be justified on the basis of empirical relationships' (p. 50). Meyer & Parsons (1989) arrived at a very similar conclusion on the basis of the responses given by 1194 students at the Cape Technikon in South Africa. While they felt that the integrity of the majority of the ASI's subscales had been confirmed by their findings, a second-order factor analysis indicated the existence of just two principal dimensions that could be unequivocally identified with meaning orientation and reproducing orientation. In addition, a study by Speth & Brown (1988) involving 383 educational psychology students at a large state university in the USA extracted only eight factors from their responses to the 64 items of the ASI, and most did not correspond in a straightforward manner to particular subscales.

Given the somewhat doubtful status of certain of the subscales of the full ASI, it might be thought useful to develop an abbreviated inventory which focused upon these two fundamental study orientations. Entwistle (1981, pp. 57–60, 100–103) devised a version for use with sixth-formers in which 30 items defined seven subscales which could be combined in various ways to yield eight indices of studying, including meaning orientation and reproducing orientation (see also Entwistle & Ramsden, 1983, pp. 53–55). This has been used with a degree of success in research with undergraduate students (e.g. Coles, 1985; Chessell, 1986; Mårtenson, 1986), but none of these studies mentioned the age of the participants. More recently, Gibbs *et al.* (1988, pp. 23–28) proposed that this instrument could be shortened still further to produce an inventory of just the 18 items concerned with meaning orientation, reproducing orientation, and achieving orientation. This was recently used to compare conventional undergraduate students and mature students taking a postgraduate diploma in terms of their approaches to studying on an oceanography unit involving independent group field-work (Gibbs, 1992, pp. 100 ff.). Both groups of students achieved high scores on meaning orientation, but the postgraduate students produced much higher scores on reproducing orientation than the undergraduate students. This was attributed to the heavier curriculum and the pressure of examinations on the diploma course, and it was concluded that students' orientations to studying were determined more by the nature of

TABLE I. Subscales contained in the 32-item Approaches to Studying Inventory

Subscale	Meaning
Meaning orientation:	
Deep approach	Active questioning in learning
Comprehension learning	Readiness to map out subject area and think divergently
Interrelating ideas	Relating to other parts of the course
Use of evidence and logic	Relating evidence to conclusions
Reproducing orientation:	
Surface approach	Preoccupation with memorisation
Improvvidence	Over-cautious reliance on details
Fear of failure	Pessimism and anxiety about academic outcomes
Syllabus-boundness	Relying on staff to define learning tasks

Note: Adapted from Ramsden & Entwistle (1981, p. 371).

their experience of higher education than by their age or by the extent of that experience (p. 163).

However, these shortened versions of the ASI are inadequate because their subscales lack sufficient internal consistency (see Watkins, 1984), and because they measure fairly specific aspects of study behaviour rather than more global study orientations (Richardson, 1992; but cf. Newstead, 1992). Richardson (1990) argued instead that it would be more appropriate to abbreviate the original ASI by focusing upon the eight subscales that had been consistently identified with meaning orientation and reproducing orientation across the different academic disciplines studied by Entwistle & Ramsden (1983, p. 52). The following investigation therefore examined whether students' responses to Richardson's short version of the ASI were significantly correlated with their ages, and in particular whether this instrument could confirm the suggestions from previous work that mature students are more likely to adopt a meaning orientation but less likely to adopt a reproducing orientation than younger students. In addition, this investigation evaluated the relative importance of students' ages, their entrance qualifications, and their scores on the eight subscales of the short ASI as predictors of their academic persistence and attainment.

Method

A short version of the ASI was devised containing the four subscales which the factor analyses of Entwistle & Ramsden (1983, p. 52) had empirically identified with meaning orientation (i.e. deep approach, comprehension learning, interrelating ideas, and use of evidence and logic) and the four subscales which had been empirically identified with reproducing orientation (i.e. surface approach, improvvidence, fear of failure, and syllabus-boundness). Table I contains brief definitions of these eight subscales, and their constituent items were reproduced as an appendix to the paper by Richardson (1990). The items were presented in the order in which they appeared in the original version of the ASI, and in each case the respondents were asked to indicate the extent of their agreement or disagreement with the relevant statement on a five-point scale from 4 for 'definitely agree' to 0 for 'definitely disagree'.

In a study of the reliability of this instrument (Richardson, 1990), two successive cohorts of 41 and 58 students taking degrees in psychology, sociology and social anthropology were seen in the context of a first-year course in research methods. All were following 4 year 'thin sandwich' honours degrees that included three periods in practical work experience, each of

20 weeks' duration, as a formal part of the degree. Students had been admitted to these courses on the basis of satisfactory grades in the General Certificate of Education (GCE) Advanced Level (or some equivalent qualifications) and their satisfactory performance at an interview. In addition, the normal entrance requirements could be waived in the case of mature applicants (who were defined at that time as students over the age of 23 years on their admission to the University), and the department in question had included a relatively high proportion of mature students in its intakes over many years.

Across both cohorts, 29 of the students were male and 70 were female. Each student was expected to attend one of two regular weekly classes as a formal requirement of the research methods course. The shortened version of the ASI was administered to each class of students at two sessions that occurred at the same time of day exactly 2 weeks apart in weeks 2 and 4 of the autumn term. The instructions asked the respondents to indicate their names on the completed ASI; however, the students were informed that their responses would be used solely for the purposes of research, and that they would in particular not be used in any way in connection with their formal assessment. Both sessions then proceeded to other class activities.

A final examining board was held to consider each student's academic performance at the end of the fourth year of study. This board assigned honours to those students who had satisfactorily completed their studies following a conventional British model (first class, upper second class, lower second class and third class), and based on a profile of 10 grades obtained in the courses taken during the third and fourth years of study (possibly adjusted in the light of the mean mark obtained across those 10 courses and in the light of any mitigating circumstances submitted). For this investigation, each student's date of birth, entrance qualifications and final degree result were obtained from official University records.

Results and Discussion

Response Rates and Entrance Qualifications

All students present at each session submitted completed response sheets: 95 forms were returned from the first session, and 93 were returned from the second session; 90 students provided data from both sessions, eight provided data from only one of the two sessions, and one student provided no data at all. The data analysis concerned the 98 students (out of the total of 99) who provided data from at least one of the two sessions.

Out of this total sample of 98 students, 60 (or 61%) were aged less than 23 years at the time of their admission, and all of these had been admitted on the basis of conventional entrance qualifications. In fact, 50 had been admitted on the basis of their grades at GCE Advanced Level, while the remainder had been admitted on the basis of equivalent academic qualifications such as passes at Higher Level in the Scottish Certificate of Education, or equivalent professional qualifications such as those of State Registered Nurse. When seen at the first of the two test sessions, these 'non-mature' students were aged between 18.0 and 22.9 years, with a mean of 19.4 years.

The other 38 (or 39%) of the students were aged 23 years or older at the time of their admission and hence were classified as mature students. Of these 10 were admitted on the basis of grades obtained at GCE Advanced Level, 11 were admitted on the basis of equivalent qualifications, and 17 were admitted without formal qualifications to the normal entry standard. (None was admitted on the basis of performance on an 'Access' course.) When seen at the first of the two test sessions, the mature students were aged between 23.1 and 49.9 years, with a mean of 29.4 years.

When their grades at GCE Advanced Level were quantified in the normal way (i.e. by scoring 5 points for a grade A and 1 point for a grade E) and summed over the (best) three Advanced Level subjects, the points scores varied between 8 and 15, with a mean of 10.9. Nevertheless, there was no significant difference between the mean score of the 50 non-mature students (10.8 points) and that of the 10 mature students (11.2 points) who were admitted on the basis of these qualifications, nor did the correlation between age and Advanced Level scores amongst these 60 students approach significance ($r = +0.14$; $df = 58$; $p > 0.25$, two-tailed test).

Comparison of Factor Patterns

Richardson (1990) showed that the factor structure of the 32 items in this shortened version of the ASI was largely in accordance with their intended structure. A common factor analysis of the responses given to these items by the entire sample of students produced eight first-order factors which generally reflected the eight subscales, and these were nested under two relatively independent second-order factors which generally reflected the two orientations to studying. There was in addition a unique second-order factor which was identified solely with comprehension learning.

The factor patterns produced by the mature and the non-mature students in this study were compared using procedures described by Jöreskog (1971). There proved to be no significant difference between the factor solutions generated by the two groups ($\chi^2 = 239.97$; $df = 268$; $p > 0.8$), and this permits an unequivocal response to the question that was originally raised by Marton (1976): qualitative differences in approaches to learning can be described using the same constructs in both younger and older students, and it is therefore legitimate and indeed appropriate to make comparisons between students of different ages using those constructs. This outcome is, incidentally, in marked contrast to the findings of previous research on academically unsuccessful students (whose study skills presumably *are* deficient) which simply fail to reveal any coherent pattern of approaches to studying at all (see Meyer *et al.*, 1990; Entwistle *et al.*, 1991). This provides yet further evidence against the notion that mature students are deficient in the skills needed for effective studying in higher education.

Comparisons of Subscale Scores

Table II shows the mean scale and subscale scores produced by the mature and non-mature students on this version of the ASI. At both sessions the mature students generated higher scores than the non-mature students on all four of the subscales associated with a meaning orientation to studying, but they produced lower scores than the non-mature students on all four of the subscales associated with a reproducing orientation to studying.

An analysis of variance was carried out on the four sub-scale scores constituting each study orientation generated by the 90 students who had attended both sessions. These analyses used the between-subjects factors of age (mature vs non-mature) and gender and the within-subjects factors of sessions and subscales. There was a significant variation among the subscales defining both of the two study orientations ($p < 0.001$ in each case). In addition, the effect of age was highly significant in the case of meaning orientation ($F = 9.86$; $df = 1, 86$; $p < 0.005$) but not in the case of reproducing orientation ($F = 0.79$; $df = 1, 86$; $p > 0.3$). However, no other effects or interactions were statistically significant. There were, in particular, no significant differences between the scores produced at the two sessions. For the remaining data analysis, therefore, the 90 students who had attended both sessions were

TABLE II. Mean scores of mature and non-mature students on the 32-item ASI

	Session 1		Session 2	
	Mature (<i>n</i> = 36)	Non-mature (<i>n</i> = 59)	Mature (<i>n</i> = 36)	Non-mature (<i>n</i> = 57)
Meaning orientation:				
Deep approach	12.92	11.92	12.58	11.54
Comprehension learning	11.00	9.37	10.61	9.07
Interrelating ideas	12.78	11.31	13.11	11.16
Use of evidence and logic	10.44	10.05	10.33	9.56
Total	47.14	42.64	46.64	41.33
Reproducing orientation:				
Surface approach	11.89	13.14	12.94	13.56
Improvidence	7.33	8.39	7.69	8.24
Fear of failure	5.72	5.85	4.94	5.70
Syllabus-boundness	6.58	7.44	6.69	7.95
Total	31.53	34.81	32.28	35.46

assigned the average of their scores at the two sessions, while the eight other students were assigned the scores from whichever of the two sessions they had attended.

Correlations with Subscale Scores

Table III shows the simple correlation coefficients between exact age and the scores obtained on the scales and subscales of the ASI in the entire sample of 98 students. Age was positively correlated with all four of the subscales defining a meaning orientation and negatively correlated with all four of the subscales defining a reproducing orientation. Two-tailed tests showed that age was significantly related to scores on deep approach ($p < 0.02$) and interrelating ideas ($p < 0.001$) and to the overall score on meaning orientation ($p < 0.005$). How-

TABLE III. Simple and partial correlation coefficients with ASI scores

	Simple		Partial	
	Age	GCE	Age	GCE
Meaning orientation:				
Deep approach	+ 0.25*	- 0.06	+ 0.20	- 0.09
Comprehension learning	+ 0.15	- 0.13	+ 0.18	- 0.15
Interrelating ideas	+ 0.35*	+ 0.02	+ 0.32*	- 0.03
Use of evidence and logic	+ 0.11	+ 0.01	+ 0.09	+ 0.00
Total	+ 0.30*	- 0.07	+ 0.28*	- 0.10
Reproducing orientation:				
Surface approach	- 0.11	+ 0.04	- 0.26*	+ 0.07
Improvidence	- 0.14	- 0.07	- 0.29*	- 0.03
Fear of failure	- 0.05	- 0.03	- 0.21	+ 0.00
Syllabus-boundness	- 0.15	+ 0.03	- 0.29*	+ 0.07
Total	- 0.15	- 0.01	- 0.35*	+ 0.04

* $p < 0.05$ (two-tailed test).

ever, age was not significantly related to the overall score on reproducing orientation, nor to any of the relevant subscale scores ($p > 0.10$ in every case).

Table III also shows the simple correlation coefficients with the total points at GCE Advanced Level for the 60 students who were admitted on the basis of these qualifications. The direction of the correlations was inconsistent amongst the four subscales defining each of the major orientations to studying, and the magnitude of these correlations was uniformly small. Two-tailed tests found no sign of any association between GCE Advanced Level points and the scores obtained on any of the scales or subscales of the ASI ($p > 0.3$ in every case).

Although the relationship between age and GCE Advanced Level points was not at all significant, it is important to establish whether each of these variables affects responses to the ASI when any effect of the other variable is statistically controlled. Table III therefore also shows the partial correlation coefficients between each of these variables and the scores on the scales and subscales of the ASI of the 60 students who were admitted on the basis of GCE Advanced Level grades. Age was still found to be significantly related to scores on interrelating ideas ($p < 0.02$) and to the overall score on meaning orientation ($p < 0.05$). The somewhat weaker levels of statistical significance can be attributed to the reduced sample size and to the fact that the variance in age was reduced by almost 65% as a result of restricting the analysis to those students admitted on the basis of GCE Advanced Level grades. Interestingly, in this analysis age was found to be significantly (and negatively) related to the scores on surface approach, improvidence and syllabus-boundness ($p < 0.05$ in each case) and to the overall score on reproducing orientation ($p < 0.01$). However, there was still no sign of any association between GCE Advanced Level points and the scores obtained on any of the scales and subscales of the ASI ($p > 0.2$ in every case).

In short, in terms of their responses to the short version of the ASI commended by Richardson (1990), the older students tended to obtain higher scores than the younger students on the four subscales of the ASI that were associated with a meaning orientation towards studying. This effect was highly significant, whether age was treated as a dichotomous variable or a continuous variable. There was no significant variation between these four subscales in the magnitude of the effect of age. Nevertheless, the subscales reflecting deep approach and interrelating ideas generated the more significant effects from a statistical point of view.

Conversely, the older students appeared to produce lower scores than the younger students on the four subscales of the ASI that were associated with a reproducing orientation towards studying. This tendency did not attain statistical significance across the sample of students as a whole, regardless of whether age was analysed as a categorical variable or as a continuous variable. It was, however, highly significant when the analysis was restricted to those students who had been admitted to the department concerned on the basis of the grades they obtained at GCE Advanced Level. This suggests that taking GCE Advanced Level courses subsequently tends to discourage a reproducing orientation towards studying in mature students. There was no significant variation between these four subscales in the magnitude of the effect of age. Nevertheless, the subscales reflecting surface approach, improvidence and syllabus-boundness generated the more significant effects from a statistical point of view.

These comparisons of mature and non-mature students provide a broad confirmation of findings obtained by Harper & Kember (1986) and by Watkins (1982, 1983) using the ASI, and they are also entirely consistent with analogous findings obtained by Watkins & Hattie (1981) and by Biggs (1985, 1987) using the Study Processes Questionnaire and the Inventory of Learning Processes. As I have commented elsewhere, 'there seems to be no support at all for the stereotypical picture of mature students as lacking the basic study skills

necessary for effective study in higher education' (Richardson, 1994, p. 318). On the contrary, as Harper & Kember (1986) noted, 'older students, rather than their younger counterparts, display those learning characteristics which traditionally higher education has purported to be striving to develop in students' (p. 220). Harper & Kember themselves put forward three possible explanations for this:

- (a) that mature students were motivated more by intrinsic goals than by vocational ones;
- (b) that younger students acquired a surface approach to learning in the final years of secondary education; and
- (c) that the prior life experience of mature students promoted a deep approach towards studying in higher education.

I myself concluded that each of these explanations had some support in the findings of empirical research (Richardson, 1994).

As in the original investigation by Entwistle & Ramsden (1983, p. 48), there was no sign of any relationship between students' GCE Advanced Level points and their scores on any of the eight subscales in the short version of the ASI. This indicates that in evaluating potential students in terms of their Advanced Level grades institutions of higher education are failing to discriminate amongst them in terms of the appropriateness of their habitual approaches to academic studying. This situation could of course be remedied at a stroke by using an instrument such as the ASI as a selection device in order to admit only those candidates who already possessed 'desirable' approaches to learning. However, this would be an ethically dubious manoeuvre, because it would convert an intended outcome of higher education into a prerequisite for admission to higher education.

Completion Rates

Four years after being admitted to the department in question, 76 (or 78%) out of the original 98 students were awarded honours degrees. Of the 22 others, 15 had withdrawn from their courses on either academic or personal grounds (possibly to undertake programmes of study in other departments or institutions), while seven had deferred the completion of their studies by taking leaves of absence. On this criterion of academic persistence, 32 (or 84%) of the mature students and 44 (or 73%) of the non-mature students completed their studies satisfactorily. Thus, mature students tended to be more likely than younger students to complete their degree programmes in the minimum period, but this was not a statistically significant trend ($\chi^2 = 1.58$; $df = 1$; $p > 0.2$). Nisbet & Welsh (1972) and Walker (1975) similarly found no difference between mature students and younger students in the same institutions of higher education in their completion rates. Woodley (1984) found that when aggregated across all UK universities older students were rather less likely to be successful in their studies, though this was specifically associated with an increased incidence of withdrawal on non-academic grounds. These findings can be reconciled by assuming that mature students may be more likely to gain admission to institutions with poorer completion rates, while within the same institution mature students are as likely to complete their degree programmes as younger students.

A multiple regression analysis was carried out to assess the role of age, GCE Advanced Level points, and scores on the subscales of the ASI as predictors of whether or not each student completed his or her degree; with a dichotomous dependent variable, such an analysis is mathematically equivalent to a discriminant analysis of the sort used by Kember & Harper (1987). Table IV shows the simple correlation coefficient between each of the predictor variables and the dependent variable, as well as the partial correlation coefficients

TABLE IV. Simple and partial correlation coefficients with course completion and degree classification

	Course completion		Degree class	
	Simple	Partial	Simple	Partial
Age	+ 0.12	+ 0.35*	- 0.05	+ 0.04
GCE Advanced Levels	- 0.06	- 0.14	+ 0.27†	+ 0.28†
Deep approach	- 0.11	- 0.08	- 0.05	- 0.02
Comprehension learning	- 0.06	- 0.14	+ 0.03	+ 0.14
Interrelating ideas	- 0.11	- 0.29*	- 0.06	- 0.17
Use of evidence and logic	+ 0.07	+ 0.41*	- 0.19	- 0.18
Surface approach	+ 0.03	- 0.02	+ 0.10	+ 0.05
Improvidence	+ 0.08	+ 0.10	+ 0.20	+ 0.20
Fear of failure	+ 0.05	+ 0.24	+ 0.12	+ 0.15
Syllabus-boundness	+ 0.10	+ 0.05	- 0.13	- 0.36*

† $p < 0.05$ (one-tailed test); * $p < 0.05$ (two-tailed test).

when any effects of the other predictor variables were statistically controlled; none of the simple correlation coefficients was significant, but in the multiple regression successful completion was associated with increased age, with higher scores on the use of evidence and logic, but with lower scores on interrelating ideas.

The discriminant analysis carried out by Kember & Harper (1987) also found a tendency for older students to be somewhat more likely to complete their programme of study, though this was significant only in the case of students following courses by distance learning (cf. Woodley & McIntosh, 1980, pp. 123–124). The greater persistence of mature students may be a reflection of the fact that they have more to lose from academic failure (whether personally, financially or vocationally) than younger students. Consistent with this, mature students tend to be more conscientious in their studying (cf. Doty, 1967; Walker, 1975), and anecdotally, at least, they tend also to be much more demanding and more insistent upon quality in their teaching (see also Smithers & Griffin, 1986, pp. 108–110).

In their study, Kember & Harper (1987) found that subscales of the ASI other than the use of evidence and logic and interrelating ideas were significant predictors of successful completion, and it is possible that in this regard the present findings may well be peculiar to the specific programmes, department or institution of higher education that was being studied. It is however intriguing that there was a slight *negative* correlation between students' GCE Advanced Level points and the likelihood of them successfully completing their courses of study.

Academic Attainment

Table V shows the degree classes awarded to the 44 non-mature graduates and the 32 mature graduates. Since degree class strictly speaking constitutes an ordinal measurement scale, Mann-Whitney tests were used to compare the two groups. The mature students did achieve slightly better degrees than the non-mature students, but the difference between the two groups was not at all significant from a statistical point of view ($U = 692$; $z = 0.16$, corrected for ties; $p > 0.8$). In particular, 75% of the mature students obtained 'good' degrees (i.e. first-class or upper second-class honours), compared with 73% of the younger students. These findings are consistent with those of most previous research involving conventional programmes of study in higher education (see Hopper & Osborn, 1975, pp. 170–175;

TABLE V. Final degree classes of mature and non-mature students

	Mature	Non-mature	Totals
First	1	2	3
Upper second	23	30	53
Lower second	8	11	19
Third	0	1	1
Completed	32	44	76
Withdrawn	2	13	15
Deferred	4	3	7
Totals	38	60	98

Smithers & Griffin, 1986, pp. 119–131; Marshall & Nicolson, 1991; Hartley & Lapping, 1992; cf. Woodley, 1984). A few studies have found better degree results in mature students or other age-related variations in academic attainment (Walker, 1975; Woodley, 1984; Lucas & Ward, 1985), but these are open to the criticism that they failed to allow for the possibility that students in different age groups tend to follow courses of study in departments which produce varying distributions of final degree classes.

For the purposes of multiple regression analysis, the degree classes were assumed to be derived from an underlying distribution of marks along a ratio measurement scale that was approximately normal in shape. They were coded as 4 for first-class honours, 3 for upper second-class honours, 2 for lower second-class honours, and 1 for third-class honours, so that a higher score represented better academic attainment. This analysis once again considered the effects of age, GCE Advanced Level points, and scores on the eight subscales of the ASI. Table IV shows the simple correlation coefficients between these predictor variables and academic attainment, as well as the partial correlation coefficients when any effects of the other predictor variables were statistically controlled. The GCE Advanced Level points score was significantly correlated with academic attainment using a one-tailed test, but otherwise none of the simple correlation coefficients was statistically significant. In the multiple regression better academic attainment was associated with lower scores on syllabus-boundness and with a higher GCE Advanced Level points score according to a one-tailed test.

This analysis found that there was still no sign of any relationship between age and academic attainment when any effects of other variables had been statistically controlled. In contrast, GCE Advanced Level points exhibited a significant, positive, but somewhat modest correlation with a student's degree class, consistent with previous findings obtained in the case of social-science students (e.g. Bligh *et al.*, 1980). Of the eight subscales in the short version of the ASI, syllabus-boundness was the only one which was significantly associated with academic attainment, although a similar result had been obtained by Kember & Harper (1987) in the case of both distance-learning courses and conventional programmes of study.

The generally weak correlations between approaches to studying and measures of academic performance are perhaps not surprising, given the interval of $2\frac{1}{2}$ – $3\frac{1}{2}$ years that had elapsed between the administration of the ASI and the assessments which counted towards these students' final degree classification. Nevertheless, they indicate that the use of instruments such as the ASI as selection devices (see above) would be otiose. It is indeed known that approaches to studying may change during conventional degree programmes, though it should be added that this is frequently in a deleterious manner (Coles, 1985; Newble & Gordon, 1985; Watkins & Hattie, 1985; Newble & Clarke, 1987). Other studies have shown that the ASI is rather more successful in predicting academic performance within the same

academic year: it tends to be positively related to the scores on deep approach, intrinsic motivation and strategic approach, but negatively related to the scores on surface approach, disorganised study methods and negative attitudes to studying (see Entwistle *et al.*, 1979; Ramsden & Entwistle, 1981; Watkins, 1982, 1983; Clarke, 1986; Miller *et al.*, 1990). It is, however, likely that the pattern of relationships between approaches to studying and academic performance will depend upon the particular modes of teaching and assessment that are involved (see Lockhart & Schmeck, 1984).

Conclusions

The results of this study have provided a somewhat clearer picture than previous investigations of the approaches to studying adopted by mature students, because they have enabled comparisons to be made between older and younger students on the same course in the same department at the same institution of higher education with a response rate that approached 100%. The findings are nevertheless consistent with those of previous research on the approaches to studying and academic performance of mature students.

First, their approaches to studying even when assessed shortly after their admission are more desirable than those of younger students in terms of the avowed aims and purposes of institutions of higher education. The close similarity between the simple and partial correlation coefficients shown in Table III implies that this is true regardless of whether or not mature students have been admitted on the basis of conventional entrance qualifications. As was noted by Richardson (1994), this in itself means that the quality of courses in higher education will actually be enriched by the admission of mature students, since it will provide school-leavers with an opportunity to learn by example from the mature students' superior approaches to learning. Second, the academic persistence or perseverance of mature students as measured by their completion rates is at least as high as that of younger students. Third, the academic performance of mature students as measured by their level of attainment on graduation is at least as high as that of younger students.

Contrary to the stereotype of mature students as being deficient in terms of their basic study skills, these findings tend to confirm the views of many academic staff who have had experience of teaching mature students. According to a survey carried out by Boon (1980), these academics believe that 'mature age students perform better overall than normal age students, that they have a positive influence on the course, and that their tutorial contribution is considerably better than that of normal age students' (p. 130). One can in fact be fairly confident in endorsing the conclusion of Woodley (1984) that 'universities should have few qualms about increasing their mature student intake' (p. 49).

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