

Learning Styles and Retention and Achievement on a two year ‘A’ level programme in a Further Education College.

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Abstract

This article reports on a longitudinal study of the relationship between teaching and learning styles and retention and achievement on an ‘A’ level programme in a college of further education. Honey and Mumford’s (1986) learning styles questionnaire was completed by ‘A’ level students at the beginning of their programme of study and their scores as activists, pragmatists, reflectors and theorists were recorded. The ‘A’ level tutors completed a teaching styles questionnaire and their scores were also recorded. The majority of ‘A’ level students and tutors were reflectors. Students who withdrew within their first year and between the first and second years of study were interviewed about their reasons for withdrawal. The findings were that a larger number of activists withdrew in the early stages of their study than would be expected by their representation in the overall cohort. The students’ final results, in terms of high raw scores and results above what would be expected based on GCSE performance, were compared with their learning styles. In this cohort of students it was found that having a high theorist tendency is beneficial to this type of academic study.

Introduction

This article reports on the findings of a two year longitudinal study to ascertain whether there is a relationship between students' preferred learning styles and retention / results on a two year Advanced GCE programme in a college of Further Education. The research was carried out with students who completed their courses immediately before the introduction of Curriculum 2000 which has led to some changes in the way that academic Post-16 students learn and are assessed. Nevertheless, the findings of this study continue to be fully relevant to current groups of AS and A2 students.

In the mid 1990's the development of inclusive learning (FEFC, 1996) meant that there was a greater need to understand the requirements of a wider range of individual students. Gone were the days when students either conformed to learning in the way tutors traditionally taught, or left because they were unable to access the teaching being offered. The Kennedy report (FEFC, 1997) gave further impetus to widening participation in Further Education colleges and this, together with the concept of lifelong learning (DfEE, 1998) has led to a much wider range of learners with individual and more diverse needs than had previously been the case. Together with widening participation came greater accountability and the imperative to raise standards and encourage all students to improve their achievement. Retention and achievement were rewarded financially with the Further Education Funding Council's (FEFC) funding methodology and colleges were penalised when students withdrew or failed.

Since April 2001, the Learning and Skills Council (LSC) with its 47 regional offices, has had responsibility for both the funding and strategic planning of Post-16 Education and Training in sixth form colleges, general FE colleges and work based learning. From April 2002 this responsibility includes school sixth forms. Improving retention and achievement has had a high priority in general FE colleges for some years and with the coming together of the various Post-16 institutions this priority is likely to gain emphasis in all areas of the sector. There is every indication that the LSC will continue with a funding regime similar to that of the FEFC aimed at ensuring that the retention of students and their achievement remain high priorities within the learning and skills sector.

Learning Styles

Knowledge and understanding of individual learning styles have been used in many FE colleges for some years to help student retention and achievement. It is argued that if students understand their own learning preferences they are more likely to be successful and therefore both stay in formal learning circumstances longer and achieve their desired outcomes. This, however, does not take into account the complexity of students' decisions about their 'learning careers' (Bloomer and Hodkinson, 1997). Young people's choices are often influenced by complex social, economic and other contextual factors, as also confirmed by the interview data from students in this study.

Tutor understanding of their own teaching styles and the learning styles of their students can also improve the learning process. Many different ways of categorising learning styles are in use. In this study Honey and Mumford's (1986) learning styles

categorisation was used. This uses four learning styles: activist, reflector, theorist and pragmatist, as represented visually on the following diagram:

Fig 1 here

Descriptions of Learning Styles

Activists are people who are open minded and happy to 'have a go' and be exposed to new situations. They are optimistic about anything new and unlikely to resist change.

However they tend to take immediate action without thinking about the consequences and often take unnecessary risks. They will rush into action without enough preparation and like to be the centre of attention.

Reflectors are careful, thorough, thoughtful and methodical individuals. They are good listeners and rarely jump to conclusions. However, they are not natural 'participants' and can be slow to make decisions. They tend to be cautious and non-assertive. They are not good at 'small-talk'.

Theorists are logical, rational and objective people. They are good at asking probing questions and are disciplined in their approach. However, they have low tolerance for uncertainty, disorder and ambiguity and are not good at lateral thinking. They do not like anything subjective or intuitive.

Pragmatists are keen to test things out in practice. They are practical, down to earth and realistic. They are business-like and get straight to the point, rejecting anything which does not have an obvious practical application. They are not interested in theory or principles and will often seize on the first expedient solution to a problem. They are impatient and task orientated.

adapted from Honey and Mumford, 1986

The four learning styles are often shown as a cycle (related to Kolb's (1986) experiential learning cycle) and some researchers (for example Gibbs, 1988) assert that for real learning to take place, all four parts of the cycle must be addressed during the learning experience. The four stages should be viewed "as an integrated process with each stage being mutually supportive of and feeding into the next ... effective learning only occurs when a learner is able to execute all four stages in the model." (Harkin, Turner and Dawn, 2002, pp40-41)

While individuals will have preferences in the way they learn and may not draw on all four areas (Kolb, 1986), the tutor who is aware of learning styles theories can help ensure a more effective learning environment for his/her students. Harkin, Turner and Dawn, (2002) suggest three ways in which this can be done. The tutor can help students feel comfortable with their learning situation and achieve success; s/he can help individual students strengthen the learning style(s) which they do not naturally favour. Lastly they can "assess the impact and implications of their own style on their students" (p43) and

use this to develop their own teaching styles to incorporate activities spanning all four learning styles

For this study the Honey and Mumford learning styles categorisation was used. This involves students completing a questionnaire in which they have to say whether they agree or disagree with 80 statements. There are no right or wrong answers and students are instructed that they should respond to the statements with their first response, rather than give a lot of thought to that response. Each statement indicates a preference for a particular learning style. By plotting the number of agreeing responses on each of the four axes, students are able to see which style they favour, so gaining insight into their learning preferences.

Honey and Mumford (1986) recommend joining up the number of responses on the four axes to produce a 'diamond' shape. Each quadrant is a combination of the two learning styles on each side of it and each quadrant has characteristics associated with the combination of styles. This gives further details of an individual's learning styles profile.

Fig 2 here

Figure 2 is a the simplified version of Honey and Mumfords' (1986) explanation which we used with the students. Honey and Mumford (1986) provide a chart with very strong preference, strong preference, moderate preference, low preference and very low preference, which makes the analysis of learning styles more complicated than suggested

above. This complexity is one of the main criticisms of Honey and Mumford's Learning Styles Inventory - answering and analysing 80 questions can be seen as tedious by younger students and some of the explanations of style do not immediately relate to learning in a formal setting. There are shorter versions of the learning styles inventory with 40 or 20 questions, which are quicker to complete and may not give such an accurate assessment of an individual's learning style profile.

Honey and Mumford's LSQ was used in this research due to its availability and because it was a tool already in use within the college to aid students' study skills. In addition there is much support material available for both tutors and students designed to help improve teaching and learning.

Another widely used categorisation is that of sensory learning styles developed by a group of colleges through inclusive learning projects set up and funded by the Further Education Development Agency (FEDA now LSDA) in the late 1990's. This uses three categories of learning styles - visual / seeing, auditory / listening and practical / kinaesthetic. Characteristics of the different preferences are provided to help students and tutors improve learning by both maximising their strengths and minimising their weaknesses.

Other categorisations have been researched and used in different sectors of the education system including primary schools and educational managers in coaching skills (DfES, 2002). For example right brain, left brain learning preferences (Shaw and Hawes, 1998),

concrete / abstract - sequential / random (Gregorc, 1984). While there are differences in the way learning styles are categorised they all have in common the belief that individuals have a natural preference for the way in which they learn. Also that learning in formal situations can be improved if both the student and the tutor understand those preferences.

This is not to advocate that tutors only teach in the way that students prefer, (this would be impossible as in almost all classes include students with different preferences).

Teaching styles should be varied to enable all students to benefit from the teaching, and by encouraging students to diversify their learning preferences they are better able to access a range of teaching and learning strategies. Most teachers will naturally teach in a way which reflects their own preferred learning style (Dixon and Woolhouse, 1996) so an awareness of different preferences and a conscious effort to diversify teaching strategies is likely to improve the overall effectiveness of the learning experience for students.

Where students and tutors do not share preferred learning styles, learning is likely to be less successful:

recent research has shown that a mismatch between an instructor's teaching style and a student's learning style can result in the student learning less and being less interested in the subject matter (Lage et al, 2000 p30)

Methodology

In the first year of the research 126 students, representing approximately 50% of the college's A level cohort, completed the Honey and Mumford (1986). Learning Styles questionnaire (LSQ.) The gender split of this cohort was 67 female students and 59 male students. At the same time their tutors (37 in total, representing 95% of all A level

tutors) completed a teaching styles questionnaire (Dixon and Woolhouse, 1996) based on the Honey and Mumford LSQ. At this initial stage of the research an analysis was made of the preferred styles of tutors and students to discover whether they ‘matched’ or ‘mismatched’, and whether this affected the likelihood of students withdrawing.

Telephone interviews were conducted with withdrawn students, whom it was possible to contact, to discuss their reasons for withdrawing. Of the 17 who withdrew during the first year 11 were interviewed. Of the 12 who did not return for the second year 10 were interviewed.

At the beginning of the second year of study, 103 students completed the Honey and Mumford LSQ. Of these 66 (30 male / 36 female) had also completed it in their first year giving a basis for the longitudinal study to show whether students’ learning styles had changed between years one and two and if there was a change, whether that change reflected the preferred teaching styles of their tutors.

At the end of the second year of the study, analysis was made of the students’ achieved grades, (both of raw high grades (A/B) and a “value added” analysis - ie achievement above that anticipated by their performance in GCSEs) in relation to their preferred learning styles. For details of how these were calculated see footnote. This enabled some tentative conclusions to be drawn about the learning styles best suited to achievement in A level courses.

To be as accurate as possible in representing both students' and tutors' learning styles we recorded a 'dominant' style where an individual had one style which was favoured over any other. We recorded 'prominent' or 'preferred' styles where an individual's profile had one or more style within two points of each other. Therefore an individual student or tutor could have up to four prominent / preferred styles.

Findings

The research findings fell into three categories:

- Relationship between tutors' and students' preferred styles and how this affected retention;
- Analysis of changes in students' preferred styles between years 1 and 2;
- Connection between preferred learning styles and achievement at 'A' level.

1. Relationship between tutors' and students' preferred styles and how this affected retention.

Table 1 summarises the dominant or prominent learning styles of the tutors (37), all the first year students in the sample (137), those who withdrew during the first year (17) and those who did not return for the second year of study (12). Most students and tutors recorded more than one prominent learning style.

 Table I here

This was irrespective of the subjects they taught. At this college A level subjects were divided into three distinct sections

- maths, science and computing
- social sciences - sociology, psychology, government & politics, accounts, business students and economics
- humanities - English, communications, media, history, geography, law, theatre studies and languages

The tutors teaching on the 'A' level programme at this college were overwhelmingly reflectors - 81%. Of all the first year students who completed the LSQ, 56% were reflectors, but only 41% of those who withdrew during the first year were reflectors. However, 86% of those who withdrew in the summer, between their first and second years, were reflectors. There appears to be a difference between the students who withdrew during the first year (some of them at a very early stage of their programme) and those who completed the first year but did not return for the second year.

When we look at the number of activists we find that only 8% of the tutors have this as a preferred style, while 27% of students overall have an activist preference. However, 53% of those who left during the first year have an activist preference, compared with 14% of those who withdrew between year 1 and 2. It would appear from these findings that preferred learning styles play some part in early withdrawal, although this is a complex and often multi-dimensional decision. From their entry profiles it was obvious that the 17 students who withdrew from the research sample during the first year had lower entry qualifications than the sample as a whole.

Eleven of the 17 students who withdrew during the first year were interviewed on the telephone by a researcher not connected with the college. The other six students were unobtainable. The students who were interviewed cited various reasons, which broadly fell into three categories. For some, a combination of these led to their decision to withdraw.

Incompatibility with college ambience

- “College was different from what I’d expected, although I wasn’t sure what my expectations were. It was like school despite being more relaxed” (Student left beginning of October)
- “I couldn’t cope with the freedom of college, I was distracted by the social life, so I have now gone back to school” (Student left in November)
- “I found it hard to get into the course” (Student left in February)

Inappropriate choice of course

- “I was not enjoying A levels. Didn’t know what to do when I left school and I chose the wrong subjects” (Student left beginning of October)

- “I just drifted into A levels. School didn’t explain things and Careers were useless. I’ve now transferred to GNVQ - they are more my kind of people” (Student left in October)
- “It took me a while to realise this was not the course for me because of the amount of work” (Student left middle of October)
- “The subject was boring, I’m really enjoying doing GNVQ because we do work experience and course work, I am not an exam person” (Student left middle of October)
- “I found A levels too difficult. I didn’t do the homework or do anything properly” (Student left in November)
- “I’m not an academic person and I’m lazy. I changed my mind about what I wanted to do” (Student left in January)

Transport / timetabling difficulties

- “I travelled in with my father, who works at the college, but I had to wait around for him. I’m now at a college nearer home” (Student left end September)
- “It was expensive to get to college and some lectures were cancelled” (Student left beginning of October)
- “I live too far away. I thought I could cope but the buses didn’t come” (Student left middle of October)

It can be seen that some of the students left very soon after the commencement of their studies in September. At this stage there was no mention of any dissatisfaction with aspects of teaching so we can assume that students were not aware of any mismatch in teaching / learning styles, although our analysis shows that there was a mismatch in terms of a preponderance of students being activists compared with a preponderance of tutors who were reflectors - see table I.

Information was obtained on 12 students who did not return to college at the beginning of the second year. These students also had lower than average entry qualifications. Ten interviews were conducted (6 with students in the original target group). All cited inappropriate choice of course and transport difficulties as contributing to their decision to withdraw, but in addition 5 of the 10 interviewed mentioned some aspect related to teaching as a factor in their decision not to return.

Quality of teaching as a reason given for decision to withdraw

1. One student reported a teacher “who could not control the class so I had to write my own notes from the book. I didn’t learn a single thing” there was a “subject which had lots of different teachers, who didn’t talk to each other”;
2. A second student said that one teacher “didn’t understand we had work in other subjects” and the “teachers didn’t put much effort into the class, they were often late or didn’t turn up and had no lesson plans”. She didn’t think the teachers “were dedicated re exams”;
3. A third student said “I found A levels difficult. It was partly me and partly the teachers, especially in [subject] where the whole class had a problem. I got too far behind to carry on in the second year”;
4. Another student mentioned the same teacher [in 3 above] who “didn’t turn up and left after a couple of months”;
5. Another said she was “very disappointed in what she was taught.”

Comparison between these students’ and their tutors’ preferred styles, overall, does not show a large mismatch with reflector and activist styles (see Table 1). With the

exception of one student (an activist with no activist teachers) there was no mismatch of teaching / learning styles for the group of students who withdrew between years one and two. Their decision to withdraw was, therefore, based on dissatisfaction with some aspect of the teaching / learning experience rather than a mismatch in teaching / learning style.

2. Analysis of changes in students' preferred styles between years 1 and 2.

In this analysis we wanted to answer two questions.

- Did the students' styles change?
- If so did this represent a change to be more like their tutors?

Of the 66 students in the longitudinal study there were only three who changed their style completely. Two changed from being reflectors to being activists while the third changed from being an activist to being a reflector. Therefore the key finding of this part of the research is that 63 out of 66 students dominant learning style did not change.

However 44 of the students 'altered' their style by adding to their predominant style in the first year, or losing one of their preferred styles. Some students will appear in both the 'lost' and 'gained' column if they added one style to their preference and lost another.

Table II here

Considering the finding that tutors in this sample were overwhelmingly reflectors, one might have expected that students would have gained reflector as part of their profile of learning styles. From this we can see that the reverse is the case. Only one student gained this style whilst seven lost it. Similarly, as so few tutors were activists one might expect that a student would have lost this preference. However the reverse can be seen here as well - four students lost an activist preference while nine gained it. The same number of students lost as gained pragmatist preferences while theorist preferences showed the greatest gain with 15, and only two losses.

A more detailed statistical analysis of whether individual students had altered their styles to reflect those of their tutors proved too complex even with the assistance of a trained statistician. The complexity involved students who have 1 to 3 preferred styles and tutors who might also have more than one preferred style. Most 'A' level students were taking two or three subjects and they might have two tutors for each subject. So, reluctantly we had to abandon this aspect of the research.

3. Connection between preferred learning styles and achievement at 'A' level.

Two aspects of achievement were analysed. While raw scores would show whether there was a relationship between students who achieved high grades and learning styles we felt that the "value added" scores (ie those who achieved higher grades than anticipated based on GCSE qualifications) also needed to be analysed.

There has been much criticism of using only raw scores to evaluate learning and other aspects of the teaching / learning process. Since the early 1990's schools have had their performance 'ranked' each year by the number of pupils gaining 5 GCSE passes at A*-C grade. In addition, there is now an annual ranking of schools, sixth form colleges and FE colleges in relation to points gained in level 3 qualifications. This ranking, based solely on raw scores, disadvantages most general FE colleges which have often offered places to students who were not able to stay on at school due to their poor performance at GCSE. Colleges have always offered "second-chance' education" (Huddleston and Unwin, 2000, p5) so if GCSE grades are a predictor of A level performance, colleges will perform poorly in comparison to those institutions which select on prior examination performance.

One Beacon status college now offers a service to any other college advertised as "A true measure of quality" which "measures the quality of teaching and learning in relation to the GCSE achievement of the student intake". By using a "value added" analysis they hope to "establish .. a more just and accountable system, to the ultimate benefit of all our students". (www.greenhead.ac.uk)

The students' grades (see footnote) were calculated by dividing their accumulated scores by three (if they took three 'A' levels) or by two (if they took two 'A' levels). This was done so as not to penalise those students who only took two 'A' levels and follows the system adopted by Greenhead College (www.greenhead.ac.uk). In line with OFSTED

practice, we omitted any student who only took one 'A' level when calculating national average scores and scores for individual institutions. (OFSTED, 2001).

Table III here

The actual numbers on this table are the number of times each learning style was recorded as prominent within an individual's profile. From our early analysis we found that the majority of both tutors and students had reflector as a preferred style so we thought we might find that reflectors achieved higher grades in their final qualifications. There was indeed a large percentage of reflector students who got high grades (37% in A/B) but there were similar percentages of reflectors in the other grade categories. What seems to distinguish those who got high grades is the percentage of theorists:

37% theorist in the A/B category

24% theorists in the C category

17% theorists in the D/E category

10% theorists in the N/U category

Of those who got high grades only a small percentage had an activist preference with the percentage of activists increasing with decreasing grades. It is significant that those indicating a theorist preference were at least twice as likely to achieve an A/B grade (7

out of 34), as compared with reflectors (7 out of 68), and three times as likely to do so compared with activists (3 out of 43) or pragmatists (2 out of 32).

Table IV here

In all achievement bands there was a high percentage of students with a prominent reflector learning style. In the group which scored 'above MTG' there were only 15% of activists as compared with 29% and 31% in the 'at MTG' and 'below MTG' groups respectively. However, 28% of theorists achieved above their MTG while in the 'at MTG' and 'below MTG' categories there were only 10% and 13% respectively - in both cases less than half compared with the 'above MTG' group. It is significant that having theorist preferences also increases the likelihood of improved achievement in the 'value added' measure of success.

Conclusions

Fig 3 here

These results are obviously only valid for this particular group of 'A' level students in this college at this time, but if it could be shown that this pattern is replicated elsewhere,

there are important implications for tutors and students in academic programmes of study.

While we do not suggest that students' preferred learning styles should prevent them from studying their chosen courses, knowledge of preferences could help colleges target extra assistance to 'at risk' students to prevent early withdrawal or advise on choice of courses / subjects. Most colleges now include study skills as part of the programme for all students and many use learning styles as a basis for this support. These findings could help target study skills support which could, in turn, improve achievement in academic study. Students could be encouraged to develop the theorist element of their learning style to aid achievement.

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Footnote

Calculation of final points scored and predicted grades

A	9
A/B	8
B	7
B/C	6
C	5
C/D	4
D	3
D/E	2
E	1
N/U	0

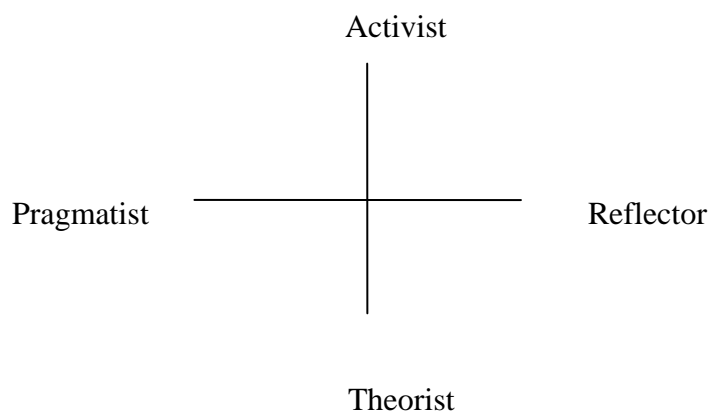


Fig 1: Honey and Mumford's learning styles

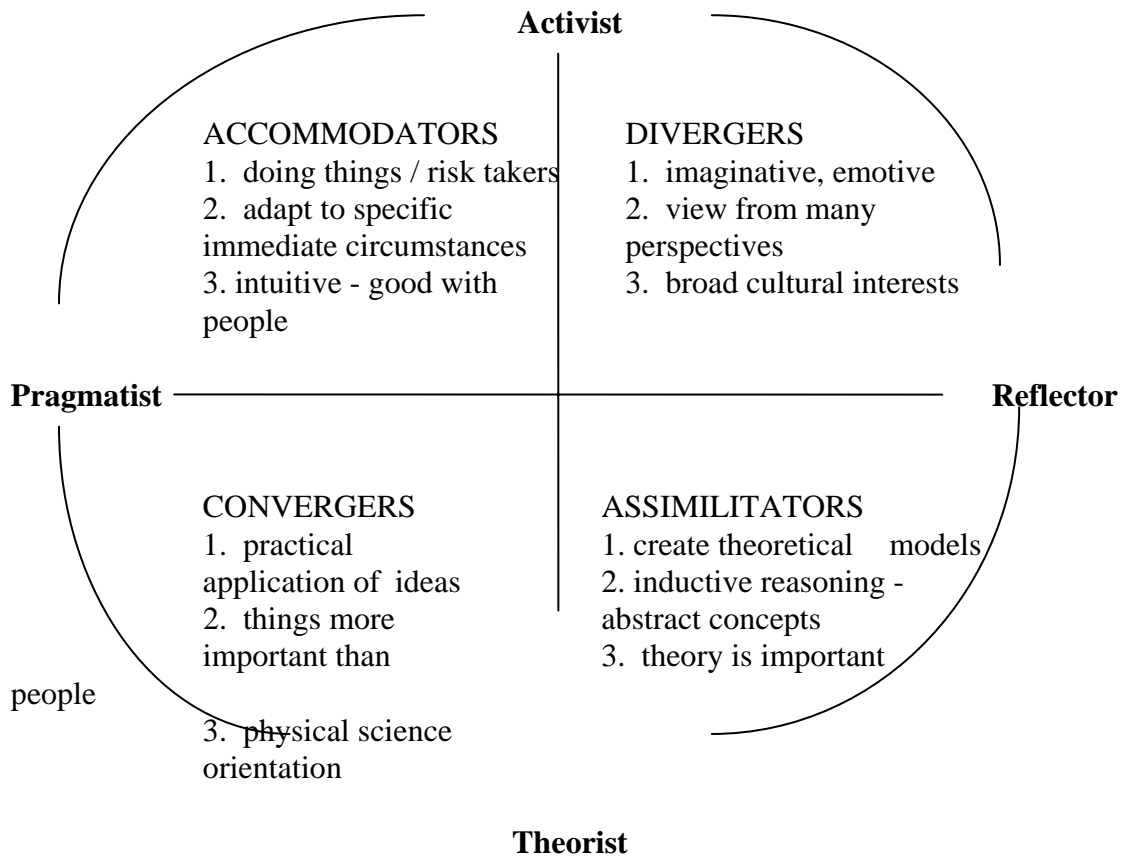


Fig 2: Learning Style Characteristics

Reflectors			Activists	
Actual number	%		Actual number	%
30	81%	Tutors	3	8%
77	56%	All first year students in sample	37	27%
7	41%	Students withdrawing during the first year	9	53%
10	86%	Students withdrawing over the summer	2	14%

Table I Preferred styles - year 1 students and their tutors

	Style lost from year 1 to year 2	Style gained from year 1 to year 2
Activist	4	9
Pragmatist	11	11
Reflector	7	1
Theorist	2	15

Table II - Changes in prominent learning styles between years 1 and 2

a) Raw scores

Grade	A/B		C		D/E		N/U	
	Actual numbers of students	%	Actual numbers of students	%	Actual numbers of students	%	Actual numbers of students	%
Activist	3	16	8	22	21	24	11	34
Pragmatist	2	11	6	17	18	20	6	19
Reflector	7	37	14	39	35	38	12	38
Theorist	7	37	8	24	16	17	3	10

Table III Raw 'A' level scores compared with preferred learning styles

b) “Value added” scores

	Above MTG*		At MTG*		Below MTG*	
	Actual numbers of students	%	Actual numbers of students	%	Actual numbers of students	%
Activist	7	15	9	29	30	31
Pragmatist	8	17	4	13	17	18
Reflector	18	39	15	48	36	38
Theorist	13	28	3	10	12	13

* MTG - Minimum target grade (based on GCSE grades)

Table IV “Value added” ‘A’ level scores compared with preferred learning styles

Overall - The majority of students and tutors on this 'A' level programme are reflectors

Retention - Students withdrawing during year 1 were predominately activist

Achievement - There appears to be a relationship between theorists and academic success

Fig 3 - Summary of findings