

An investigation into the learning styles of University of Southampton medical School entrants and outcomes of first year primary BM exams.

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Abstract:

The learning experience is a phenomenon that has sought much interest and investigation, in particular the ability to categorise learners according to their learning style preference. This project set out to investigate relationships between learning styles on entrance to medical school, the learning style of 'reflector' (40.37%) being dominant. There is also a correlation between previous institution and learning style, with sixth form students having a higher percentage of 'activists'. Over 50% of students changed their learning style over the year, with activists becoming the dominant group. Finally, theorists achieved higher results in the end of year exam.

Introduction:

Kolb in 1976 first identified that individuals learn in different ways. Further research has expanded the knowledge in this area e.g. (Prosser M and Trigwell K), (Ramsden P), (Gibbs and Habeshaw). For example, some individuals need to practically apply procedures in order for deep learning to occur whilst others may learn better by reading a book. In any large body of students there are going to be a number of different learning styles, and it is therefore essential to ensure that the curriculum includes a wide variety of teaching methods to suit all learning styles. This research first identifies student learning style types on entrance to medical school. This information alone is useless unless it is relevant to the course and we have an understanding of the student's background. For this reason the second part of this investigation explores the relationship between student's preferential learning style and the type of institution they experienced before embarking on the Bachelor of Medicine (BM) course at the University of Southampton.

The investigation explores the University of Southampton 5 year Bachelor of Medicine course for 2003. The curriculum is a mixed mode, systems based integrated curriculum, with longitudinal and transverse strands. Due to the mixed nature of the curriculum we were interested to see if students have changed their learning style to adapt to the curricula.

Finally, in order to ensure teaching methods employed in the School of Medicine result in the same degree of learning between the different learning style groups, the first year primary BM exam results were compared.

Outcomes:

1. To identify the learning styles of new entrants to the University of Southampton Medical School to determine whether one learning style group is represented in a higher proportion.
2. To identify whether there is a correlation between learning style A'level results and demographic data.
3. To observe whether learning styles change between entry and end of first year for students at the University of Southampton Medical School.
4. To determine whether there is any difference between learning style group and the end of first year exams (Primary BM)

Methods:

Consent/Ethics:

In considering standard ethical protocols it was decided that any problems would be overcome if all information was treated as confidential and anonymous. Hence informed consent was sought. (Wilkinson T 342-61). All potential participants received an explanation of the project and were offered the chance to ask further questions. The following points were drawn up and all participating students signed consent forms to say they agree to the following:

"To make the project successful we require **your** support and consent.

You can expect from us the following:

1. We will treat all information received as confidential and anonymous.
2. A fair explanation of the project and its purpose
3. A description of the benefits and risk reasonably to be expected
4. An offer to answer any enquiries concerning the project
5. An instruction that the person is free to withdraw consent and to discontinue participation in the project at any time without prejudice to the participant.

I give my permission to the named researchers above that they may access and use my data that I have provided to the School of Medicine.

I will share my data of the learning styles inventory with them.

I give my permission to the named researchers above that they may access and use my BM primary results."

Learning styles inventory:

There are many learning styles inventories (Canfield's Learning Styles Inventory) (Learning styles) and much debate about which one to use. (Newble D.I. and Entwistle N 175), (Robotham D). It was beyond the scope of the study to determine which was the most accurate. Administrative rights had already been obtained by the University of Southampton for Honey and Mumford Learning styles inventory. (Honey P), therefore this inventory was used.

Data Collection:

Learning styles:

Honey and Mumford's inventory is composed of 80 tick box questions. The results of which give the learner an indication of their preferred learning style. Activist, Reflector, Theorist or Pragmatist.

All first year medical students were contacted by email and asked during a lecture to provide us with their learning styles information (which they would complete as part of the New Generation Project earlier in the week). Students were asked to repeat the Learning Styles Inventory at the end of the academic year.

BM Primary results:

The School of Medicine provided the BM primary results for those students that had agreed to take part in the study.

Demographic data:

Students completed an information sheet providing details of school type and qualifications on entry to medical school.

All information was immediately transferred into Microsoft Excel TM.

Results:

109 students out of the cohort of 219 (49.8%) completed the first Inventory, 165 (75.3%) completed the second.

Results of Outcome 1

To identify the learning styles of new entrants to the University of Southampton Medical School to determine whether one learning style group is represented in a higher proportion.

Results showed the reflectors were the dominant group.

Learning style	Percentage of students
Activist	30.28% (n=33)
Theorist	14.68% (n=16)
Reflector	40.37% (n=44)
Pragmatist	5.50% (n=6)
Mixed preference	9.17% (n=10)

Table 1. The percentage of students at the beginning of the year showing a preference in each of the 4 learning style groups are:

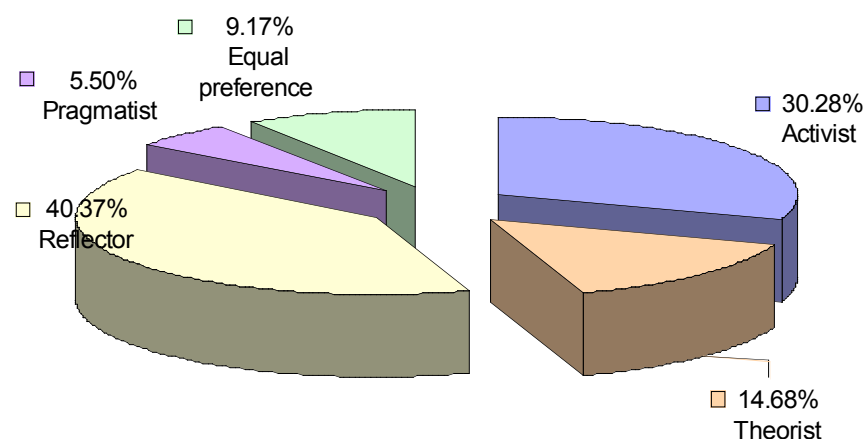


Figure 1. Pie chart to represent learning style preference of the 2003 entrants to the University of Southampton Bachelor of Medicine degree

Results of Outcome 2

To identify whether there is a correlation between learning style, A-level results and demographic data.

The institution type was categorised as:

- Sixth form college
- Independent School
- Technical college
- Foundation course
- Further education
- Other

Those students from sixth form education showed a dominant activist style, whilst those from independent schools and universities showed a dominant reflector style.

	Activist	Theorist	Reflector	Pragmatist	Equal preference
Sixth form	13	7	10	2	5
Independent school	6	5	10	0	2
FE college	0	0	1	0	0
University	9	0	12	2	2
Medicine foundation course	1	2	3	0	1

Table 2. Student's previous institution and learning style

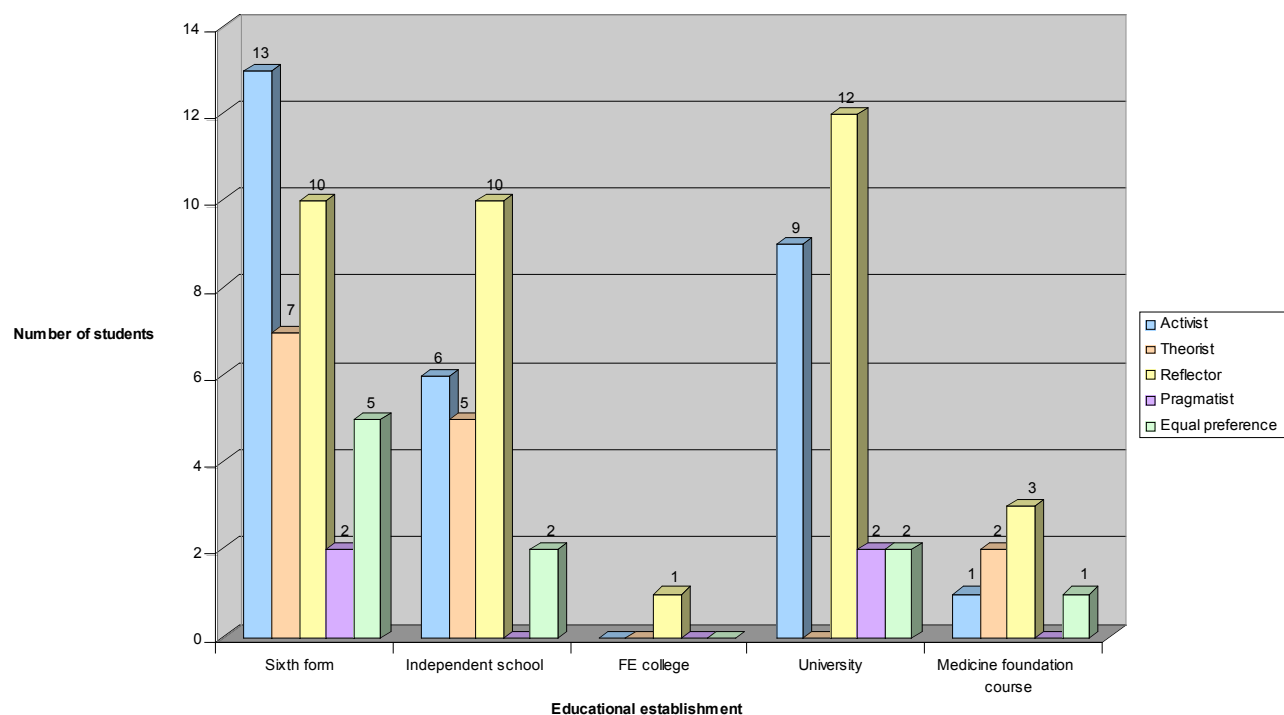


Figure 2. Relationship between educational history and learning style preference on entrance.

Other demographic details such as A-level results were not investigated as planned because all the students had very similar grades.

Results of Outcome 3

To observe whether learning styles change between entry and end of first year for students at the University of Southampton Medical School.

Of the 109 students that completed the Learning Styles Inventory at the start of the year 91 completed it at the end. 48% of students did not change their learning style. 52% of students experienced a change in learning style preference.

The most dominant group changed from reflector to activist.

Learning style	Percentage of students on entry	Percentage of students at the end of year 1
Activist	30.28% (n=33)	38.18% (n=63)
Theorist	14.68% (n=16)	13.93% (n=23)
Reflector	40.37% (n=44)	30.30% (n=50)
Pragmatist	5.50% (n=6)	4.24% (n=7)
Mixed preference	9.17% (n=10)	13.33% (n=22)

Table 3. Percentage of students at the beginning and end of the year showing preference for learning styles group.

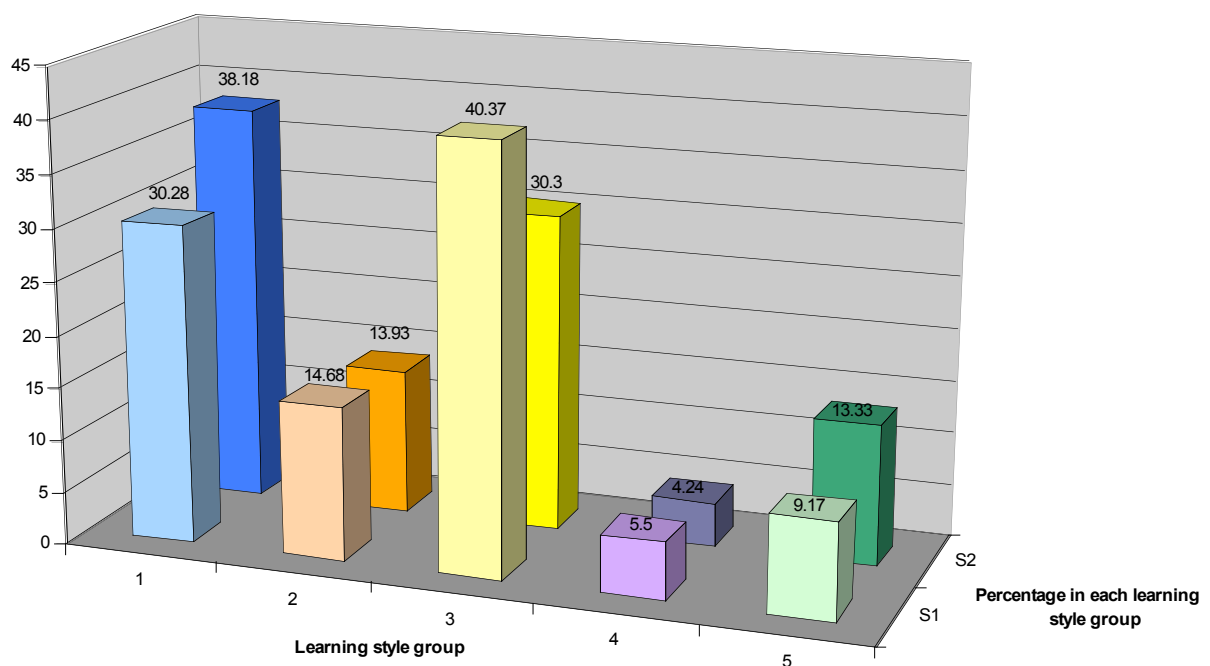


Figure 3. Comparison of percentages in each of the learning styles group on entrance (S1) and at the end of the year (S2).

Results of Outcome 4

To determine whether there is any difference between learning style group and the end of first year exam results (primary BM).

The activists, reflectors and those with equal preference all showed similar mean percentages. However the theorists achieved significantly better BM Primary exam results, whilst the pragmatists achieved the lowest mean percentages.

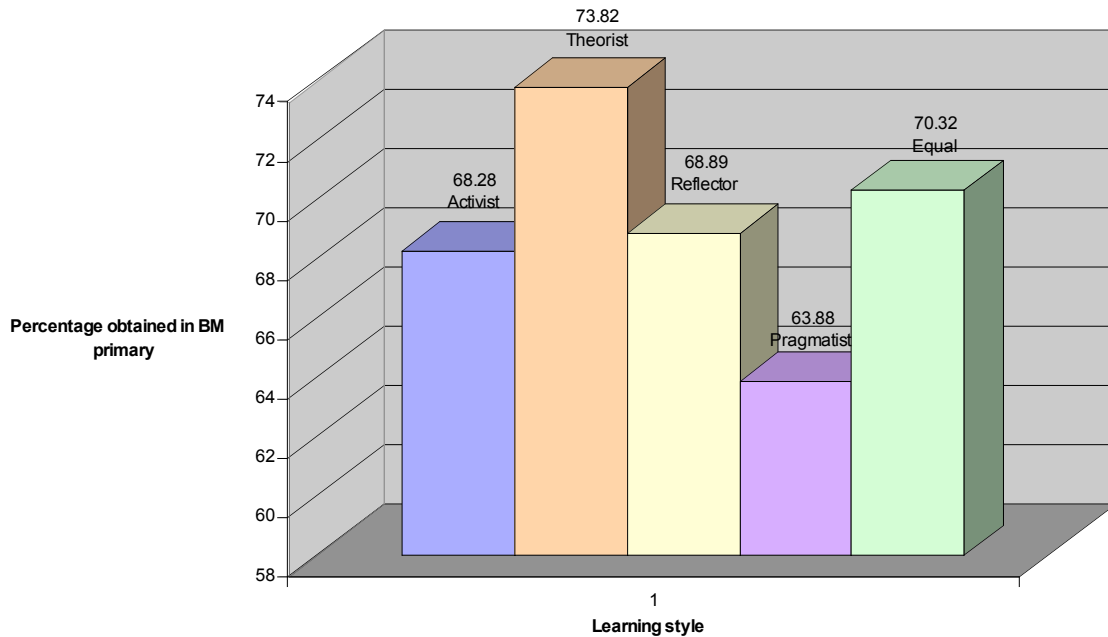


Figure 4. BM exam result percentages versus learning style preference.

Discussion:

Whilst the debate continues over the usefulness of learning styles, this research has provided at local level an insight into a cohort of students attending the School of Medicine at the University of Southampton. It allows us to conclude that there is a significantly higher number of reflectors within the cohort on entrance. Whether there was a higher number of reflector style students applying or if the admission process selects reflector style students is beyond the scope of this investigation, however this might be an area of research for the future.

This project revealed that there is a relationship between learning style preference and the students educational history, in that students learning styles from sixth form colleges was predominantly activist, whereas students from university, independent schools and foundation courses were predominantly reflectors. This may reflect the type of learning and teaching they have previously been exposed to.

The students show plasticity in their learning style as over 50% changed their learning style by the end of the year. It can only be presumed that this was caused by the nature of the curriculum and the modes of teaching, learning and assessment they experienced, particularly as the curriculum includes a mixture of teaching methods, from didactic lectures, interactive tutorial sessions and student centred group work.

One particularly important result impacting on the curriculum was that the small number of theorists performed significantly better at the end of year exams compared to the other groups. This leads to discussion as to how successful these students learning pathways were and if this is related to the modes of the curriculum.

In conclusion this research has provided a valuable insight into the learning style of first year medical students. Not only has this work highlighted areas to be considered by the curriculum development working party, it has also raised questions about student applications.

Dissemination:

1. A University of Southampton School of Medicine seminar is to be arranged to share and discuss the findings at local level.
2. Our results will also be shared via the school intranet MEDIS
3. Centre for Learning Anatomical Sciences website will host a copy of this report.
<http://www.som.soton.ac.uk/divisions/Education/clas/welcome.htm>
4. A draft paper is currently underway for planned submission to the Journal of Medical Education.

Reference List:

Canfield's Learning Styles Inventory. Yahoo . 2001.

Learning styles. University of Southampton . 2003.

Gibbs and Habeshaw. Preparing to Teach. An Introduction to Effective Teaching in Higher Education. 2nd ed. 1998. Honey P. Honey and Mumford. Internet . 2005.

Newble D.I. and Entwistle N. Learning styles and approaches: implications for medical education. Medical Education 20[162], 175. 1986.

Prosser M and Trigwell K. Understanding Learning and Teaching. Open University Press, 1999.

Ramsden P. Learning to Teach in Higher Education. 2 ed. 2003.

Robotham D. The application of learning style theory in higher education teaching. PubMed . 2000.

Wilkinson T. Research, informed consent and the limits of disclosure. Bioethics 15[4], 342-61. 2001.