Approach to learning and the academic performance of a group of medical students – any correlation?

S D L P Subasinghe, D N Wanniachchi*

AL 2003 batch of students, Faculty of Medicine, University of Colombo

Abstract

Objectives: The study was conducted to determine the correlation if any, between the approach to learning and the academic performance of a group of medical students.

Methodology: The study was designed as an observational descriptive cross sectional study involving A/L 2007 batch of students of the Faculty of Medicine, Colombo. The approach to learning was assessed using Biggs's Revised Two Factor Study Process Questionnaire (13) and academic performance was determined by results of the Introductory Basic Sciences examination.

Results: Results showed both the predominant motive and strategy of learning belong to the deep category with mean scores for both being 14.6 out of 25. The mean scores for deep and surface approaches were 29.2 and 24.9 out of 50 respectively. Out of the study group 65.5% (n=109) were deep learners and 32.7% (n=54) were surface learners. Seventy three percent (n=76) of deep learners and sixty percent (n=32) of surface learners had achieved a high academic performance, and learning approach and academic performance correlated significantly. (Pearson's r = 0.119) Gender did not have a significant effect on the approach to learning.

Conclusion: The most frequent approach adopted by students being a deep approach is favourable in terms of medical education. Our findings suggest a small positive correlation between learning approach and academic performance where students with a deep approach achieve a higher performance and vice versa. Therefore we suggest that motivating medical undergraduates towards a deeper approach to studying would be beneficial to them in achieving the expected long term goals.

Introduction

This study was designed to determine the correlation between the approach to learning and the academic performance of medical students. In psychological terms learning is defined as a relatively permanent change in behaviour that occurs through experience. There are different approaches that people adopt when learning. The quantity and quality of learning is determined by the approach to learning students adopt. The way that students approach learning plays an important role in determining the outcome of any educational endeavour. Surface/ superficial, deep, and strategic are the three basic learning approaches adopted by students, as identified by researchers in medical education (1). Amongst them, deep and surface are the two main qualitatively different approaches, derived from original empirical research by Marton and Säljö (2) and since elaborated by Entwistle (3), Ramsden (4) and Biggs (5).

Students adopting a deep approach are motivated by an interest in the subject material and/or recognition of its vocational relevance. There is an intention to understand; to focus on the concepts applicable to problem solving. Students relate previous knowledge to new knowledge, theoretical ideas to everyday experience and the task is interpreted as an opportunity to gain new insight (6). In addition, the deep approach is found to facilitate the retention of factual details more effectively (1). Students adopting a surface approach are predominantly motivated either by a desire to complete the course or a fear of failure, thus fulfilling the requirements by memorizing and reproducing the material they believe is likely to come up in assessments, resulting in a superficial level of understanding (6). With regards to students adopting a strategic approach, the predominant motive is the achievement of

**Corresponding author: S D L P Subasinghe, MBBS (Colombo), Relief House Officer, Neurosurgical unit I, National Hospital of Sri Lanka, Colombo (E-mail: lilanthisubasinghe@yahoo.com)*

high grades and they use either the surface or deep approach depending on what they feel would produce the most successful results (6). According to several researchers, measuring students' approaches to learning has been seen as the means of the following (6-9).

- Helping students become better learners
- Assisting individual academics who are concerned in monitoring and improving the effectiveness of their teaching
- Identifying students at risk because of ineffective strategies
- Observing the outcomes and experience of learning

In the present study, Biggs Revised Two Factor Study Process Questionnaire (R-SPQ2F) (10) was used to evaluate the individual student's approach to learning which, according to Biggs, is determined by the motive and strategy of learning.

Evaluation of a student's approach to learning in a medical curriculum is important in several ways. Deep learning involves critical analysis of new ideas, linking them to already known concepts and principles, relating and integrating knowledge from other parts of the course, which leads to understanding and long-term retention of concepts so that they can be used for problem solving in unfamiliar contexts which is the fundamental of success in all the disciplines of clinical medicine (11). Medical curricula usually aim to promote a deep approach to studying, which is associated with academic success (12). Deep approach is the most appropriate and desirable way of learning, is closely linked to the intellectual processes anticipated in all medical students and is the means of life-long learning (1).

It has been shown that the approach to learning has a significant effect on the subsequent outcome of the specific learning process. Deep approaches have been associated with a higher quality of learning outcome whilst surface approaches have been associated with unsatisfactory learning outcomes (2). Research in higher education has repeatedly shown that approach to learning is related to the quality of learning outcomes (13). When evaluating the outcome of deep learning in medical education, it is considered far superior in achieving long term favourable results. Graduate status and gender had significant effects on approach to studying and a deep approach was associated with higher academic scores (11).

Method

This observational descriptive cross sectional study was carried out at the Faculty of Medicine, University of Colombo. The objectives of the study were to determine the approach to learning of a selected group of medical students and to assess the correlation between the approach to learning and their academic performance.

The study population included all (202) students of the A/L 2007 batch (second year) of the Faculty of Medicine, Colombo. The specified study population was selected since all the students had recently faced an important examination during the medical course and the results of the particular examination could be used to compare their academic performance. The batch of 2007 was selected since they were the most immediate batch after the specified examination.

Data collection was carried out via a self-administered questionnaire, Biggs's Revised Two Factor Study Process Questionnaire (R-SPQ2F) (10) to measure the students approach to learning. Students' academic performance was assessed by the overall result they obtained for their first year exam, Introductory Basic Sciences Stream (Main) in August 2009.

Data was collected after obtaining informed written consent. Personal identification data was collected only to compare the approach to learning and the academic performance of a specific student.

The responses to the questionnaire were analyzed according to the scoring system provided by Biggs (10) and each student was given separate scores on deep motive and strategy, surface motive and strategy and thus deep and surface approach, i.e.:

- Deep Approach Score: Σ All deep motive scores + All deep strategy scores
- Surface Approach Score: Σ All surface motive scores + All surface strategy scores

The mean score for each approach was calculated and students were identified as deep learners or surface learners based on the score each of them obtained. The students who had equal

scores for both approaches were not categorized into either category and those obtaining equal scores were separately categorized as equal. Data was computerized and analyzed using frequency distribution and Pearson's Correlation with SPSS© for Windows© Evaluation Version.

Ethical clearance was obtained from the Ethics Review Committee, Faculty of Medicine, University of Colombo and permission to carry out the study was obtained from the Dean, Faculty of Medicine, Colombo.

Results

Response rate for the questionnaire was 82% (n=166), of which 45.5% (n=75) were male. The motive for academic performance and the strategy of learning were each scored out of 25. The predominant motive for academic performance evidenced by the students was a deep motive, with a mean score of 14.6 whereas for surface motive mean score was 11.9.

The predominant strategy of learning among them was again deep with a mean score of 14.6. However, this was just above the mean score for surface strategy, 13.1. The gender variation in the mean scores of predominant motive and strategy for learning is shown in Table 1.

Table 1: Mean scores for deep and surface motive and strategy

	Deep Motive	Deep strategy	Surface motive	Surface strategy
Male	15.25	15.16	12.37	13.56
Female	14.14	14.11	11.64	12.68

The score for the approach to learning was out of 50, which is the sum of scores for motive (25) and strategy (25) in deep and surface category each. The mean scores for deep and surface approaches were 29.2 and 24.9 respectively. The mean scores for the two approaches obtained by males and females separately are given in Table 2. Based on these results, 65.5% (n=109) of the study population were deep learners and 32.7% (n=54) were surface learners, whereas 1.8% (n=3) had obtained equal scores in both approaches (Figure 1). Females accounted for 52% (n=57) of deep learners and 62% (n=34) of superficial learners, but gender was not significantly associated with the learning approach (χ^2 =1.79; p>0.05) (Figure 2).

Table 2: Gender variation in the mean scores for deep and surface approaches

	Deep approach	Surface approach
Male	30.41	25.93
Female	28.26	24.32

Figure 1: Selection of approach to learning among study groups

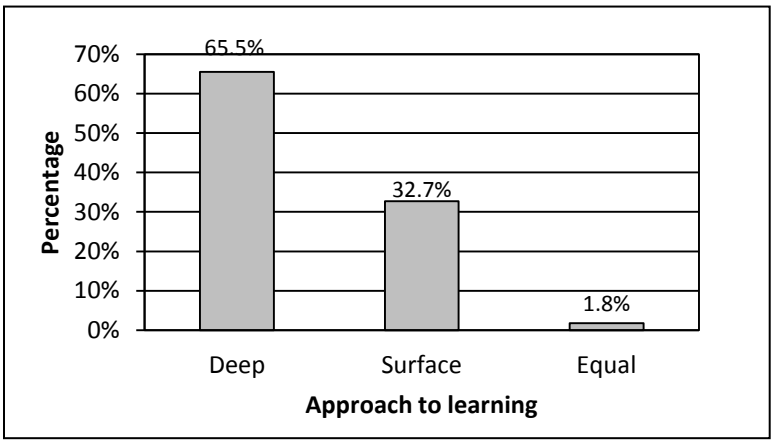
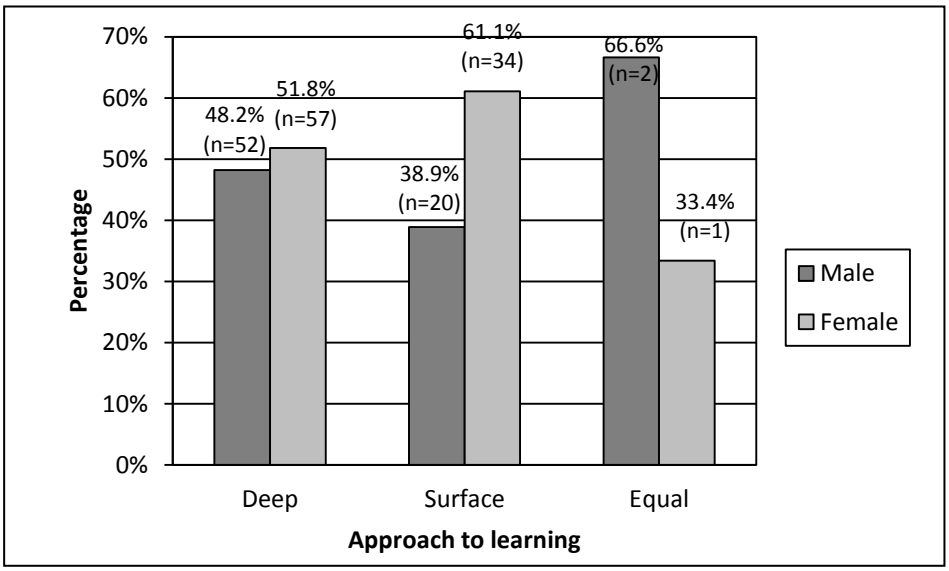


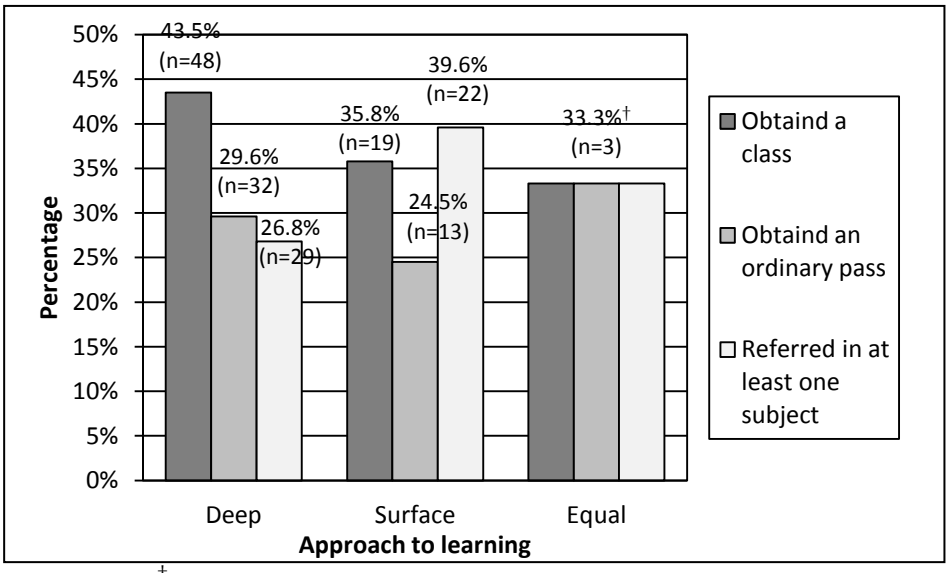
Figure 2: Gender variation in selecting the approach to learning



Analysis of performance at the Introductory Basic Sciences (IBS) Examination at the end of the first year revealed that 41% (n=68) had passed with a class (honours), 28% (n=46) had obtained an ordinary pass and 31% (n=52) had referred in one or more subjects.

The distribution of academic performance at IBS in relation to the learning approach is depicted in Figure 3. There was no statistically significant association between the academic performance at IBS with the learning approach. (χ^2 =2.78; p>0.05)

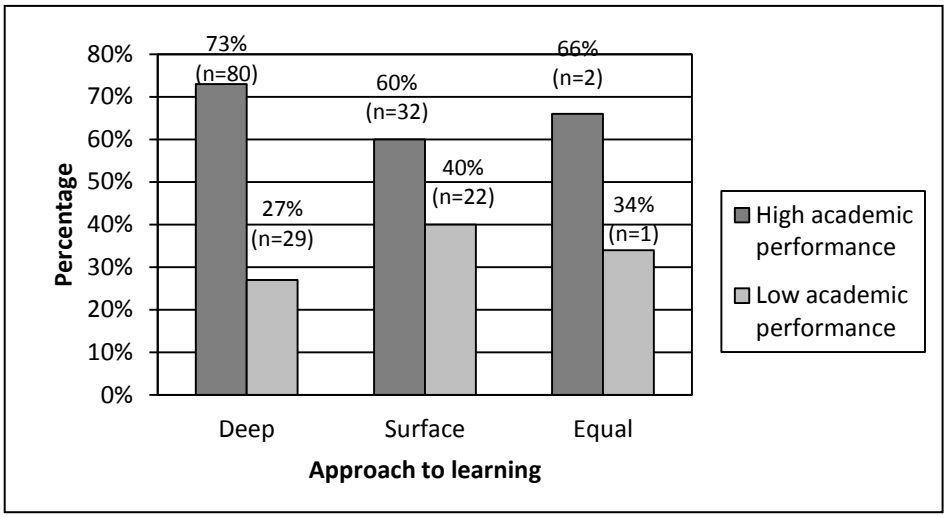
Figure 3: Distribution of performance at the Introductory Basic Sciences Examination in relation to learning approach



†all 3 groups within 'equal approach to learning' were 33.3% each

In analyzing the correlation between approach to learning and academic performance, Pearson's correlation coefficient value was 0.119, which thus revealed a small positive correlation between academic achievement and depth of learning. Thus high academic achievement correlated with deep learning and low academic achievement correlated with surface learning. Higher academic achievement was considered as passing the specified examination at the first attempt with or without obtaining honours; low academic achievement was taken as being referred in one or more subjects. The distribution of high and low academic performance in relation to the approach to learning is shown in Figure 4.

Figure 4: Distribution of approach to learning in relation to academic performance



Discussion

The study was planned to determine the correlation between the approach to learning and the academic performance of medical students. A specific learning approach is determined by the motive towards studying and the strategy of learning. The results have shown that both the predominant motive and strategy in the study group belong to the deep category. This has led the predominant approach to learning adopted by them being a deep approach. This is a favourable finding in terms of medical education (1) since it involves critical analysis of new ideas, linking them to already known concepts and principles and using the knowledge saved in that way for problem solving in unfamiliar contexts (11). The mean scores achieved for motive and strategy in both deep and surface wings were higher among males. Gender did not show a significant effect on selecting the approach since more or less equal proportions of males and females were included in both approaches except for a very slight female predominance. These results are comparable to the findings of Kumar and Sethuraman in 2007 (14). Only 3 students had scored equal in both approaches and they fell into the category of strategic learners.

Out of the students who were found to have adopted a deep approach, a significant minority had passed with a class at IBS examination (43.5%, n=48) whereas only 26.9% (n=29) had been referred. In contrast, among the students with a surface approach, the proportion referred in at least a single subject (39.6%, n=22) was higher than the proportions with higher academic achievement, (i.e.: with a class (35.8%, n=19) and an ordinary pass (24.5%, n=13)). Although this result was not statistically significant, it describes a demonstrable variation in academic achievement in relation to the students' approach to studying.

On further analysis, students were categorized in to high and low academic achievers depending on their results. Thus all students who passed the exam at first attempt were considered high achievers, whereas those referred in at least one subject were considered low achievers. Most of the high achievers were found to be deep learners and low achievers were found to be superficial learners. Compared to superficial learners, a lesser proportion of deep learners had shown a low academic performance. The Pearson's Correlation Coefficient obtained in this study was positive but since the value was 0.119, it seemed that the approach to learning and the academic performance had only a slight correlation. This demonstrates that students with deep learning motives and strategies come out with a somewhat better performance and vice versa.

This study suggests that motivating medical undergraduates towards a deeper approach to studying would essentially benefit them in achieving the expected long term goals in their career as medical professionals. This could be done through lectures, workshops on learning approaches, etc. They should be targeted towards helping the individual student in discovering their approach to learning, guiding them towards a deeper approach and letting them experience the benefits.

References

1. Abraham RR, Vinod P, Kamath MG, Asha K, Ramnarayan K. Learning approaches of undergraduate medical students to physiology in a non-PBL- and partially PBL-oriented curriculum. *Advances in Physiology Education* 2004;32:35-7.

2. Marton F, Säljö R. On qualitative differences in learning: 1— Outcome and Process. *British Journal of Educational Psychology* 1976;46:4-11.

3. Entwistle NJ. Styles of Learning and teaching; an integrated outline of educational psychology for students, teachers and lecturers. Chichester: John Wiley; 1981.

4. Ramsden P. Learning to teach in higher education. London: Routledge; 1992.

5. Biggs J. What do inventories of students' learning process really measure? A theoretical review and clarification. *British Journal of Educational Psychology* 1993;83:3-19.

6. Newble DI, Entwistle NJ. Learning styles and approaches - implications for medical-education. *Medical Education*. 1986;20(3):162-75.

7. Dart BC, Clark JA. Helping students become better learners: a case study in teacher education. *Higher Education* 1991;22:317-35.

8. Svensson L. On qualitative differences in learning. I. Study skill and learning. *British Journal of Educational Psychology* 1977;47:223-43

9. Shreemathi Y. Learning approaches of health profession students: a study of undergraduate medical students of Manipal academy of higher education [PhD Thesis]. Manipal, Karnataka, India: Manipal academy of higher education; 2001.

10. Biggs J, Kember D, Leung DY. The revised two-factor Study Process Questionnaire: R- SPQ-2F. *British Journal of Educational Psychology* 2001;71:133-49.

11. Gordon C, Debus R. Developing deep learning approaches and personal teaching efficacy within a preservice teacher education context. *British Journal of Educational Psychology* 2002;72:483-511.

12. Mattick K, Dennis I, Bligh J. Approaches to learning and studying in medical students: validation of a revised inventory and its relation to student characteristics and performance. *Medical Education* 2004;38(5):535-43.

13. Mashishi MK, Rabin CE. A study of the approaches to learning, engagement with the learning context and conceptions of learning of a group of fourth year accounting students. In: Cornerstones: what do we value in higher education? Proceedings of the 22nd HERDSA Annual International Conference; 1999 Jul 12-15; Melbourne, Australia.

14. Kumar LR, Sethuraman KR. Learning approaches in dental and medical students In AIMST: a comparison between deep and surface approaches. Paper presented at: The International Medical Education Conference; 2007 April 20-21; Kuala Lumpur, Malaysia.