

## Learning styles of preclinical students in a medical college in western Nepal

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### Abstract

**Objectives:** Information on the learning styles of medical students are lacking in medical colleges in Nepal. Learning styles may be associated with student understanding and may predict success in examination. The present study was carried out to obtain information on learning styles and preferences for teaching of fourth semester medical students and note the association, if any, between respondents' personal characteristics and preferences for learning styles and types of teaching. The correlation between preferences for learning styles and types of teaching and performance in the second year university examination was also explored.

**Methods:** The study was carried out during October 2003 at the Manipal College of Medical Sciences, Pokhara, Nepal using the Approaches and Study Skills Inventory (ASSIST) instrument. Information on the respondents' personal characteristics was collected. Respondents had to indicate their degree of agreement with a set of statements using a modified Likert-type scale. The statements were grouped into three main learning styles and two types of teaching. The median scores among different subgroups of respondents were compared using appropriate non-parametric tests ( $p < 0.05$ ).

**Results:** Ninety-two students (92%) participated; fifty-six were male. Thirty-one respondents were Nepalese, 48 were Indians. Majority were educated in English medium schools. The median scores for deep and surface learning styles were 64 and 49 respectively (maximum score=80). The scores for strategic learning was 75.5 (maximum score=100). There was no clear preference for any particular type of teaching. Indian students used more surface apathetic learning strategies compared to others. There was a negative correlation between surface learning and marks obtained in the final examination.

**Conclusions:** The students mainly used deep and strategic learning styles. Differences in preference for learning styles and types of teaching were noted according the respondents' personal characteristics. This was a preliminary study and further studies are required.

**Key words:** Academic performance, Learning styles, Medical students, Nepal, Teaching methods

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Learning style has been described as the strategy that a student brings to a learning situation.<sup>1</sup> Personal characteristics, previous experience and the learning environment have been shown to influence learning styles.<sup>2,3</sup>

Three main learning styles have been defined among students. The surface (or instrumental) learner memorizes lists of superficial knowledge for regurgitation in examinations followed by forgetting.<sup>4,5</sup> The strategic (or achieving) learner focuses on assessment requirements and uses whichever method (deep or surface) is more appropriate for a particular topic. This learning style may result in patchy understanding and lack of integration across topics.<sup>5</sup> The deep learner searches for understanding and meaning.<sup>4</sup> Deep learning is motivated by a desire for personal understanding and is demonstrated by the students' search for principles

and by integration of knowledge across different learning domains.<sup>5</sup> Deep and strategic learning styles predict success in final examinations while surface learning predicts failure.<sup>6,7</sup>

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The Manipal College of Medical Sciences (MCOMS), Pokhara, Nepal affiliated to Kathmandu University admits students from different nationalities for the undergraduate medical (MBBS) course. The Nepalese students are admitted on the basis of the marks obtained in entrance examinations and performance in a personal interview conducted by the college while students of other nationalities are admitted on the basis of their twelfth standard or A level marks. The basic science subjects of Anatomy, Physiology, Biochemistry, Pathology, Pharmacology, Microbiology and Community Medicine are taught in an integrated manner during the first four semesters.

Information regarding learning styles and preferences for different types of teaching are not available in medical colleges in Nepal. This information may be helpful in planning teaching learning sessions for students and deciding on assessment methods. Hence the present study was carried out. The objectives of the study were to:

- a) Obtain information on the learning styles and preferences for teaching of fourth semester medical students
- b) Obtain information on the demographic and personal characteristics of respondents
- c) Note the association, if any, between respondent characteristics and preferences for different learning styles and types of teaching and
- d) Note the association, if any, between learning styles and preferences for teaching and performance in the second year university examination.

### **Materials and methods**

The study was carried out among fourth semester medical students at MCOMS, Pokhara, Nepal. The students were explained the objectives of the study and were invited to participate.

The learning styles were assessed using the Approaches and Study Skill Inventory (ASSIST) learning-styles instrument during October 2003.<sup>8</sup> The instrument consists of a number of parts. The first is the students' conception of learning. The second part deals with approaches to studying and the third is about preferences for different types of courses and teaching.

The approaches to studying part consist of 52 statements and the students have to indicate their degree of agreement with the statements on a modified Likert-type scale. The preferences for different types of courses and teaching part consist of 8 statements. The statements were grouped into

subgroups and then were further grouped together into three main types of learning styles and two main preferences for courses and teaching.<sup>9</sup>

The median scores and the interquartile ranges were calculated. The demographic characteristics of the respondents like age, sex, nationality, medium of instruction at school and whether self-learning and problem-solving were considered important at school were noted.

The students who wanted information on their individual learning styles were instructed to write their names or roll numbers on the questionnaire. Their average scores in the second year examination were calculated and the correlation between preferences for different types of learning and for different types of courses and teaching and the examination scores were calculated using Spearman's correlation coefficient ( $p < 0.05$ ).

The median scores among different subgroups of respondents were compared using non-parametric tests. Mann-Whitney test was used to compare the median of two subgroups while Kruskal Wallis test was used to compare the medians of the subgroups when the number of subgroups was more than two. The median scores for deep, strategic and surface-aphathetic learning styles were compared with respect to the respondents' personal and demographic characteristics. The median score for each learning style was compared individually. A similar procedure was carried out for teaching styles. A  $p$  value  $< 0.05$  was taken as statistically significant.

### **Results**

A total of 92 of the 100 fourth semester students participated in the study. Fifty-six students were male. Thirty-one were Nepalese, 48 were Indians, 12 were Sri Lankans while one student was of other nationality. Majority of the students were educated in English medium schools and came from schools where self-learning and problem-solving were regarded as important. The demographic and personal characteristics of the respondents are shown in Table 1.

The median score for the three types of learning and the two types of teaching are shown in Table 2. The students mainly used deep and strategic approaches to learning but there was no clear preference for any particular type of teaching.

Table 3 shows the median scores for different types of learning and preferences for different types of teaching according to the nationality and medium of

instruction of respondents. Indian students were having a more surface apathetic learning style compared to others ( $p=0.022$ ). English medium students used deep approaches to learning ( $p=0.037$ ) and were in favour of ‘supporting understanding’ type of teaching ( $p=0.006$ ) compared to vernacular medium students.

Seventeen students had written their personal information on the questionnaire and their marks in the final examination could be calculated. Of the

seventeen students, 7 were Nepalese, 8 were Indians and 2 were Sri Lankans. There was a negative correlation between surface apathetic learning and marks obtained in the second year university examination (Spearman’s  $\rho = -0.757$ ,  $p < 0.01$ ). There was also a negative correlation between marks obtained and preference for ‘transmitting information’ type of teaching (Spearman’s  $\rho = -0.710$ ,  $p < 0.001$ ).

**Table 1:** Demographic characteristics of the student respondents

Characteristic	Number of respondents (percentage)
<b>Age (in years)</b>	
19	37 (40.2)
20	37 (40.2)
Others	18 (19.6)
<b>Sex</b>	
Male	56 (60.9)
Female	36 (39.1)
<b>Nationality</b>	
Nepalese	31 (33.7)
Indians	48 (52.2)
Sri Lankans	12 (13)
Others	1 (1.1)
<b>Medium of instruction at school</b>	
English	70 (76.1)
Vernacular	22 (23.9)
<b>Importance of problem-solving at school</b>	
Important	87 (94.6)
Not important	4 (4.3)
<b>Importance of self-learning at school</b>	
Important	86 (93.5)
Not important	6 (6.5)

**Table 2:** Median scores for the three types of learning and the two types of teaching

Characteristic	Median score (Interquartile range)
<b>Learning styles</b>	
Deep (Max. score =80)	64 (11.75)
Strategic (Max. score =100)	75.5 (16)
Surface apathetic (Max. score =80)	49 (11)
<b>Preferences for types of teaching</b>	
Supporting understanding (Max. score =20)	17 (5)
Transmitting information (Max. score =20)	17 (4)

**Table 3:** Median score according to the Nationality and medium of instruction of respondents

Median score	Nationality			P value	Medium of instruction		P value
	Nepalese	Indian	Sri Lankan		English	Vernacular	
Learning styles							
Deep	65	63.5	63	0.304	66	60.5	0.037
Strategic	74	76.5	77	0.381	75	75	0.989
Surface apathetic	47	51.5	48	0.022	49.5	49.5	0.489
Teaching styles							
Supporting understanding	18	17	15	0.059	18	15	0.006
Transmitting information	16	18	16.5	0.184	17	16	0.424

### Discussion

The curriculum of Kathmandu University to which our college is affiliated is student-centred, problem based, integrated, community oriented, electives embodied and systematic.<sup>10</sup> At the completion of the MBBS course the medical graduate should understand the principles and practice of modern medicine and should be able to advance his/her knowledge and skills through continuing medical education and research. In a problem-based curriculum, the subject content is structured around health problems and the learning as it progresses, constantly circles back to build upon previous knowledge.<sup>11</sup> Studies have shown that a problem-based curriculum encourages a shift to deeper approaches to learning and reduces learning pathologies.<sup>12,13</sup>

Different instruments like the Learning Style Inventory, Lancaster Approaches to Learning Inventory, Kolb's Learning Style Inventory and Learning Preferences Inventory were used to investigate the learning styles of students. ASSIST has been developed from ASI (Approaches to Studying Inventory) and includes scales intended to extend the description of studying and approaches to teaching. The definition of the strategic approach has been broadened. A study in Chile had shown that more than two-thirds of students were convergers or assimilators.<sup>14</sup> They had a tendency to assimilate large amounts of information and abstract the main concepts. A study in the United Arab Emirates had shown that students prefer teacher-structured learning experiences dealing with concrete and applied tasks, rather than abstract tasks.<sup>15</sup> In the United Kingdom, it was seen that medical students had high scores on surface approach during all years but the first-year students had a low score on deep approach.<sup>16</sup> During

later years the scores on deep learning showed a progressive increase.

Success in final examinations was found to be related to strategic or deep learning styles in the final year.<sup>16</sup> The amount of knowledge gained from clinical experience was also related to these learning styles. A study in the United States had shown that both dental and medical students equivalently used a deep approach to learning.<sup>17</sup> However, medical students demonstrated an increasing use of achieving orientation over the course of their study.

In South Asia, students enter medical college after twelve years of schooling. The students adopt surface learning strategies in their preclinical environment. Previous studies had shown that younger age of admission of students was correlated with more use of surface learning strategies.<sup>4,18</sup> No significant association of age with learning styles was noted in our study. Our students were mainly of 19 and 20 years of age and were predominantly non-graduates. The number of students at the extremes of age was less. Nepalese students used more deep and less of strategic and surface apathetic learning strategies compared to other nationalities. They had a higher preference for 'supporting understanding' type of teaching. The selection criteria for Nepalese students are more stringent and they perform better academically and this may be related to the result. The reasons for preference of deep learning strategies by Nepalese students were not explored in the present study

The English medium students used more deep learning strategies and preferred a 'supporting understanding' type of teaching. In our study, a large proportion of the vernacular medium students were Sri Lankans. Unfamiliarity with the language and the stress of adjusting to a different environment and

assessment requirements may have been a factor behind adoption of surface learning styles. However, a factor going against this is that the students had been in Nepal for nearly two years at the time of the study and the initial stress of adapting may have decreased. The reasons for the less use of deep learning strategies by vernacular students were again not explored in the present study.

A negative correlation between surface apathetic learning scores and performance in the second year university examination was seen. This has also been observed in previous studies.<sup>5,19</sup> In our study, students mainly used deep and strategic learning strategies. The students have fortnightly assessment tests in basic science subjects and monthly assessment tests during the clinical years. There are also frequent sessional and university examinations. Considering the overwhelming importance attached to performance in these examinations it may be expected that students will use a strategic learning style keeping in mind assessment requirements. Our study had many limitations. The study was carried out only among one semester of students and the sample size was small. The first and second semesters were not studied. The clinical years of study were not covered. Longitudinal studies of a particular semester were not carried out.

### Conclusions

It was encouraging to note that students were using deep learning strategies. A negative association was noted between surface apathetic learning and assessment marks but the sample size was very small. The reasons for the greater use of surface learning strategies by Indian students and students educated in vernacular medium schools must be investigated. Further studies across different semesters and longitudinal studies to evaluate the changes in learning styles, if any, as students' progress through medical school are required. The results from these studies may be helpful for planning and modifying teaching learning and assessment methods in medical colleges in Nepal.

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