Approach to learning of medical students in a Caribbean medical school

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ABSTRACT

Introduction: Students' perception of the learning environment, the curriculum and assessment may influence their approach to learning. Student approach to learning has not been previously studied at Xavier University School of Medicine, Aruba. Hence the present study was carried out. **Objective**: Obtain information about respondents' conceptions of learning, approaches to studying and preferences for different types of courses and teaching **Method**: The Approaches and study skills inventory (ASSIST) was administered to first to fourth semester undergraduate medical (MD) students during the last week of September 2013. Different personal characteristics were noted. The median scores for conceptions of learning, approaches to studying and types of teaching among different subgroups of respondents were compared using appropriate non-parametric tests (p<0.05). **Result**: Seventy-one of the 86 students (82.5%) participated. Respondents predominantly used deep and strategic approaches to studying and there was a slight preference for a transmitting information type of teaching. Students aged between 20 to 25 years used more deep approach to learning and preferred a supporting understanding teaching approach. First and third semester students used more surface apathetic learning approaches and showed greater syllabus boundedness. Canadian students showed greater deep approach to learning. **Conclusion**: Deep and strategic learning approaches were mainly used. The influence of the integrated curriculum on learning approaches can be investigated through longitudinal studies. Studies among clinical students and in other medical schools are required.

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Introduction

A learning approach is defined as the process which an individual adopts in their quest for knowledge (1). While the learning approach is an individual characteristic it is also a potentially malleable way of interacting with the learning environment (2). Student learning approaches may be related to personal characteristics, previous experience and the learning environment (3).

There are three main approaches to learning. Deep approach (DA) is an organized one where the emphasis is internal and learners are motivated by the relevance of the syllabus to their personal needs (4). Surface apathetic approach (SAA) is a superficial method of learning where the emphasis is on memorization

and information retrieval. Strategic approach (SA) is one where learners are mainly focused on doing well in assessments.

Students' perception of their learning environment may be a key factor affecting their approach to learning (5, 6). It has been suggested that approaches to learning may change over the course of an undergraduate medical program if suitable efforts to promote these changes are made (7). Student-centered activities such as problem-based learning (PBL) may promote deep learning among students (8).

A number of studies have been carried out using approaches and study skills inventory for students (ASSIST) among medical students. In a medical school in Nepal, students mainly used deep and strategic learning styles (9). Preferences for learning approaches and types of teaching varied according to the personal characteristics of the respondents. In a medical school in the United Kingdom (UK) the scores were highest for a deep approach and lowest for a surface approach and there was relatively little change during the course of the program (10). Approaches to studying and preferences for particular teaching methods were studied at the University of Colombo in Sri Lanka (4). Male and female students showed similar approaches while the preference for the strategic approach showed differences according to age among preclinical students. Male students preferred a teacher who supported understanding while females preferred a passive transmission of information.

Xavier University School of Medicine, Aruba is a private medical school admitting students mainly from the United States and Canada to the undergraduate medical (MD) program.[13] Students do the first five semesters of study in Xavier University School of Medicine and then do their clinical rotations in the US. Recently a number of changes in teaching-learning have been carried out in the institution. Among the changes are shifting to an integrated, organ system-based curriculum, using standardized patients for learning and assessment, introducing a medical humanities module, starting problem-

based learning sessions, introducing early clinical exposure, conducting family health visits, and teaching students to use essential medicines rationally.[13] At present (September 2013) semesters one to three follow an integrated curriculum while the fourth semester has the old, subject-based curriculum. From January 2014 all four semesters will be integrated.

Learning approaches of students has not previously been studied in the institution. The information is important to plan teaching-learning activities for students and in making decisions about student assessment. Hence the present study was carried out with the following objectives:

1. Obtain information about respondents' conceptions of learning, approaches to studying and preferences for different types of courses and teaching
2. Note differences in these, if any, according to demographic and personal characteristics of respondents and
3. Note the association if any between respondents' self-assessed rating of their performance and their scores in various categories.

Method

Student learning approaches were studied using the Approaches and Study Skills Inventory (ASSIST) instrument during the last week of September 2013 (1). The questionnaire is divided into three parts: the first which examines the respondents' perception of learning, the second which concentrates on their perception of studying and a third which concentrates on their preferences for specific types of courses and teaching.

The study was conducted among the first to the fourth semester undergraduate medical (MD) students at Xavier University School of Medicine, Aruba. Respondents were explained the aims and objectives of the study and invited to participate. It was emphasized that participation is voluntary and written informed consent was obtained from all participants. The study was approved by the Institutional Review

Board (IRB) of the institution through notification number XUSOM/IRB/2013/07.

The statements were grouped into three main learning approaches and two preferences for courses and teaching (2). Demographic and personal information like age, gender, semester of study, whether the respondent had completed a graduate course of study, nationality and whether the student had completed a premedical course at Xavier University School of Medicine, Aruba or in other institutions was noted. Students who wanted personal feedback on their learning styles were requested to mention their names in the questionnaire.

Three main learning approaches, deep, strategic and surface-apathetic and two preferences for types of teaching and courses, supporting understanding and transmitting information were studied using the questionnaire. The median scores among different subgroups of respondents were compared using appropriate non-parametric tests. A p value less than 0.05 was taken as statistically significant. The correlation if any between the scores and the respondent's self-rating of their performance was calculated using Spearman's correlation coefficient (p<0.05).

Result

A total of 71 of the 86 students (82.5%) completed the survey. Table 1 shows the demographic characteristics of the student respondents. Most students were between 20 to 25 years of age. Certain students did not complete all the required personal details. About 53% of students were male, 35% had completed a graduate course of study, 28% were of United States nationality, 17% were Canadians and 22% were from other countries. Twenty-two respondents (31%) had completed a premedical course of study. (Insert Table 1 here)

Table 2 shows the median scores for conceptions of learning, approaches to studying and preferences for courses and teaching. Respondents predominantly used deep and strategic approaches to studying and there was a

slight preference for a transmitting information type of teaching.

Table 3 shows the median scores which were significantly different among different subgroups of respondents. Students aged between 20 to 25 years used more deep approach to learning and preferred a supporting understanding teaching approach. First and third semester students used more surface apathetic learning approaches and showed greater syllabus boundedness. Canadian students showed a greater preference for a deep approach to learning.

There was a significant positive correlation (p =0.017) between overall student rating of their performance and preference for a supporting understanding type of teaching. The correlation between overall student rating of their performance and preference for a strategic learning style and overall student rating of their performance and their conception of learning as being related to personal development was close to significance (p=0.064).

Discussion

As previously mentioned Xavier University School of Medicine Aruba is an offshore medical school admitting students mainly from the United States and Canada to the MD course. Majority of the students are of South Asian origin. Respondents predominantly used deep and strategic approaches to studying and there was a slight preference for a transmitting information type of teaching. Canadian students showed a greater preference for a deep approach to learning. The median scores for the deep, strategic and surface apathetic approach were 60, 73 and 52 respectively.

In a medical school in Nepal, the median scores for deep, strategic and surface apathetic approach were 64, 75.5 and 49. The deep and strategic scores were higher and the surface apathetic scores lower than in the present study. That study was carried out among fourth semester students while the present study was conducted among students from the first to the fourth semester. At the University College, Dublin, Ireland graduate

entry medical students used a combination of deep and strategic approaches to learning and male students adopted the deep approach more.[14] The authors concluded that students showed a mature approach to learning and used the requisite learning style to achieve clinical and academic success.

Various instruments have been used to investigate the learning styles of medical students ranging from Learning Style Inventory, Lancaster Approaches to Learning Inventory, Kolb's Learning Style Inventory and Learning Preferences Inventory. The approaches to studying of medical students were investigated at the University of Colombo, Sri Lanka (4). In our study the median score for deep approach to learning increased from 56 to 62 from the first to the fourth semester students. The increase however was not statistically significant. In the Sri Lankan study clinical students had the lowest score for DA (4). In a study in a medical school in Edinburgh, Scotland there was no significant difference in scores as students progressed through medical school (10, 15). Among the reasons proposed were students' approaches to learning may be established before they enter the university, scores for DA were already high at the start of the program and changes in learning environment may not have been enough to alter approaches to studying which students regard as successful. The school had introduced approaches which promote deep learning like problem-based learning (PBL), and constructively aligned written assignments and examinations during year two of the course.

There were no significant differences in median scores according to gender. A similar finding was shown in the Sri Lankan study (4) and in a study carried out in an Indonesian medical school (16). In the Nepalese study also there was no significant difference in scores according to gender (9). In our study the score for DA was highest among students between 20 to 25 years of age. The maximum number of students was also in this age group. In the Nepalese study no significant difference according to age was seen. In Nepal most students were aged 19 or 20 years and the range for age was less than in the present study. In the Sri Lankan study SA scores were significantly affected by age among preclinical students (4) while in a study carried out among the University of Alberta, Canada's incoming class higher surface learning styles were associated with younger age of admission to medical school and higher grade point average (GPA) (17). In Colombo, Sri Lanka the approaches to learning was studied among first year and final year undergraduate and postgraduate medical students (18). The predominant learning approach among all three groups was SA. Postgraduates had significantly higher scores for DA and SA. There was no significant difference in scores among first and final year undergraduate students. The scores for SA, SAA and DA were 68.99, 50.93 and 57.11 among first year students and 66.28, 66.28 and 55.92 among final year students. The DA scores were higher than those in the present study while the SAA scores were higher among final year students and lower among first years than those reported in the present study. In another Sri Lankan study the scores for DA, SA and SAA were 62, 67 and 47 (4). The DA score was higher, SA score lower and the SAA score lower than in the present study.

In our study Canadian students had higher scores for DA compared to Americans and students of other nationalities. In the study conducted in Nepal Indian students had higher SAA scores compared to others (9). We are not able to explain for the difference in scores according to nationality.

The relationship between students' learning styles and their academic performance, how they do in high stakes examinations and participation in continuing medical education (CME) has been described in the literature. In a study conducted in the United States (US), a deep approach to learning showed a significant positive correlation with performance in a high stakes clinical performance examination (CPX) while surface approaches showed a significant negative correlation (19). A postal survey was carried out in Canada to study the approaches to learning among physicians in Ontario (20). The study found that a perceived heavy workload was

associated with surface approaches to learning and with various barriers to CME while the deep approach was associated with independent learning and no barriers. A study conducted at the University of Colombo, Sri Lanka found that students with a deep approach achieved a higher academic performance and motivating medical students towards a deep approach would be beneficial (21).

Strategies to modify student learning approaches have attracted attention recently. Self-directed learning (SDL) involves the learner as an active participant and encourages the development of a deep learning approach (22). PBL and guided discovery learning adopted by Newcastle and Dundee (23) in the UK are two learning approaches which exploit the merits of a learner centred approach. A recent study had explored whether assessment drives student learning (24). Based on a detailed review of literature the authors concluded that formative assessment is more likely to promote a deep approach to learning while summative assessment may contribute to a surface approach. However no final conclusion could be drawn as to these effects and further studies were recommended.

Thus though further studies may be required it could be reasonable to conclude that a deep learning approach should be encouraged among students. As our students hail predominantly from the US and Canada, at present modifying learning approaches may have an impact on these countries. However, the number of students who graduate from the institution is low and the impact on these countries' health systems is unlikely to be profound. We have introduced PBL, formative assessments and a greater amount of SDL in our revised curriculum (13) which we are confident will promote deep learning among students. In the local Caribbean context most schools still follow a traditional discipline based curriculum mainly geared towards preparing students for step 1 licensing exams. PBL, SDL and other active learning strategies should be encouraged. Internationally a number of schools follow an integrated curriculum with greater emphasis on SDL and active learning strategies which may be helpful in promoting deep learning among students. As mentioned later ASSIST could be used to study approaches to learning of students in other medical schools, both in the Caribbean and internationally.

The strength of the study was the high response rate. The study had limitations. Learning styles were assessed using only one instrument. Learning styles of students during the clinical years of study were not investigated. Certain students did not complete all the required demographic information.

Conclusion

Deep and strategic approaches were mainly used by respondents. There was a slight preference for transmitting information type of teaching. The reason for a greater use of surface apathetic approach by the third semester students has to be investigated. Studies among students during the clinical years of study are required. Longitudinal follow up of learning styles will help understand the influence of the new integrated curriculum and greater opportunities for self-directed learning on the learning styles of students. Studies in other medical schools in the Caribbean are required.

Acknowledgement

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Table 1: Demographic characteristics of respondents

Characteristic	n (%)
Age	
Less than 20 years	6 (8.5)
20-25 years	45 (63.4)
Greater than 25 years	9 (12.7)
Gender	
Male	38 (53.5)
Female	29 (40.8)
Semester	
First	15 (21.1)
Second	14 (19.7)
Third	21 (29.6)
Fourth	21 (29.6)
Completed graduate course of study	
Yes	25 (35.2)
No	28 (39.4)
Nationality	
US	20 (28.2)
Canadian	12 (16.9)
Others	16 (22.5)
Completed a premedical course of study	
Yes	22 (31)
No	35 (49.3)

Table 2: Median scores for conceptions of learning, approaches to studying and preferences for courses and teaching

Characteristic	Scores
Conceptions of learning	
Instrumental approach (max 15)	13
Personal understanding and development (max 15)	13
Learning styles	
Deep (max 80)	60
Seeking meaning (max 20)	15
Relating ideas (max 20)	15
Use of evidence (max 20)	15
Interest in ideas (max 20)	15
Strategic (max 100)	73
Organized studying (max 20)	14
Time management (max 20)	13
Alertness to assessment demands (max 20)	15
Achieving (max 20)	16
Monitoring effectiveness (max 20)	16
Surface apathetic (max 80)	52
Lack of purpose (max 20)	10
Unrelated memorizing (max 20)	13
Syllabus boundedness (max 20)	13
Fear of failure (max 20)	15
Preferences for types of teaching	
Supporting understanding (max 20)	16
Transmitting information (max 20)	17

Table 3: Median scores which were significantly different according to respondents' demographic and personal characteristics

Respondent characteristic	Median score	P value
Age	Deep approach	0.031
Less than 20 years	56.5	
20-25 years	61	
Greater than 25 years	58	
Age	Supporting understanding teaching approach	0.017
Less than 20 years	14.5	
20-25 years	16	
Greater than 25 years	15	
Semester	Surface apathetic approach	0.039
First	52	
Second	49.5	
Third	55	
Fourth	48	
Semester	Syllabus boundedness	0.042
First	14	
Second	13	
Third	14	
Fourth	11	
Nationality	Deep approach	0.047
United States	60	
Canadian	62	
Others	56.5	