



# Why a teacher-centered medical school curriculum may result in a poor educational environment?

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## ABSTRACT

**Context:** Students' achievements, satisfaction, and success have been found to correlate with their perception of their educational environment (EE). **Objectives:** The objectives of the present study were to identify (a) the medical students' perceptions of their EE at a school with a teacher-centered curriculum (b) the reasons behind the items with low ratings and (c) ways to improve the EE at this school. **Methods:** In this article, the focus will be on the qualitative part of the mixed method of study, which was conducted at a large medical school in Riyadh, Saudi Arabia during 2006-2007. A total of 1132 students filled out a bilingual (Arabic and English) version of the Dundee Ready Educational Environment Measure (DREEM) inventory. Five focus group discussions with 28 students were conducted. The low scoring areas of the DREEM were used as input for the discussion. **Findings:** The mean total DREEM score for the medical school was 94.7 ( $\pm$  21.5) out of a maximum of 200. The main curriculum variables contributing to poor DREEM scores were curriculum overload, stress, lack of feedback, and poor teaching skills. The possible solutions to these problems, as suggested by the students were to involve the students in the learning process, courses to help the faculty to develop their teaching skills, assessments with provision of feedback, stronger student support system and introduction of study skills courses for student's. **Conclusions:** This study provides insight into the reasons associated with a poor learning climate. The strategies to promote a healthy EE point to relatively more student-centered elements in the curriculum and the introduction of a study skills course in the 1<sup>st</sup> year.

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## INTRODUCTION

The educational environment (EE) is defined as a set of factors that describe what it is like to be a learner within an organization [1]. It refers to the social, psychological, and pedagogical contexts in which learning occurs [1].

A healthy EE is crucial for the success of any curriculum and is vital for the delivery of quality training and promoting effective student learning [2-4]. There is an empirical connection between the environment and the valuable outcomes of students' achievement, satisfaction, and success [1,5].

There is also a relationship between students with high aspirations and a supportive school environment [6]. It has been suggested that a supportive, learning-oriented culture is extremely important for the creation of competent physicians [7].

The Dundee Ready Education Environment Measure (DREEM) is an instrument designed for measurement of the EE specifically for undergraduate medical education [8]. It has been validated and used worldwide by many researchers to compare different medical schools' environments [9,10]. As shown in Table 1, an overview is given of studies looking at the EE in different medical schools worldwide. There is a trend of higher

total scores in the new student centered schools compared with teacher centered (traditional) schools [Table 1].

Students views on the learning climate provide signals to its effectiveness [23]. The students' feedback, therefore, plays a pivotal role for the success of any educational climate. The literature on the EE until now has been mainly quantitative, reporting only students' perceptions and has not explored in detail the reasons underlying the low scores. The DREEM, as used in most studies, is valuable in pointing out the areas of concern, but it does not give any detail about the underlying reasons for the problem areas identified and suggestions for improvement, which are usually addressed in qualitative studies like current one.

## Objectives

The objectives of the current study were to identify:

- The medical student's perceptions of their EE at a school with a teacher centered curriculum
- The reasons behind the low scoring areas
- Remedial measures needed to improve the EE at this school.

## METHODS

The study was conducted at the College of Medicine, King Saud University (KSU), Riyadh, Saudi Arabia in the academic year 2006-2007. This study uses a mixed method, for this paper the focus is on the qualitative part.

The KSU Medical College curriculum at the time of data collection followed a teacher centered approach. The main instructional methods were lectures with very few opportunities for small group discussions. The course was divided into a pre-medical year followed by 3 years of basic sciences and 2 years of clinical rotations. During the pre-medical year, students studied English language in the first semester (an introductory course) followed by one semester of Physics, Chemistry, Biology and Biostatistics. At the medical college they began by studying Anatomy, Physiology and Biochemistry, followed by Pharmacology, Microbiology and

Pathology and an introduction to clinical medicine. The last 2 years consisted of six clinical rotations of 3 months each. The teaching was mainly via didactic lectures with very little time for reading, self-directed learning, and social or leisure activities. The instructional method was teacher-centered. There was no academic and learning support center and no formal mentoring system.

## Participants

A total of 1132 students' participated in the quantitative part of the study. A total of 28 students' from the clinical phase were randomly selected for the qualitative part of the study.

## Questionnaire

The DREEM inventory contains 50 statements on a 5-point Likert scale. The items of the inventory are scored 4 for strongly agree, 3 for agree, 2 for uncertain, 1 for disagree and 0 for strongly disagree. However, 9 of the 50 items are negatively worded and scored in reverse. The inventory has a maximum score of 200, which indicates the ideal EE.

The inventory has five subscales [8,24]

## Data Collection

The 28 student's (14 males and 14 female) were interviewed. A total of five focus group sessions took place. Each meeting lasted around 1½ h. Consent was obtained from the participating students for video or audio recording. The students were asked to comment on those items given a negative rating by more than 50% of the student's in the quantitative study [Table 2].

The students were asked the following three questions:

1. To what extent do you agree or disagree with the students' negative perception of this item?
2. What is your explanation for this finding?
3. What solutions do you suggest to solve/fix this problem?

**Table 1: A comparison of educational environment scores reported from medical schools with traditional and innovative curricula (classification based on spices criteria by Harden *et al.*, 1984)**

Curriculum	Author	Year	College	EE score/200	Country
Traditional	Roff <i>et al.</i> [9]	2001	Medical School in Nepal	130.0	Nepal
	Roff <i>et al.</i> [9]	2001	Medical School in Nigeria	118.0	Nigeria
	Nahar <i>et al.</i> [11]	2010	Medical College	110	Bangladesh
	Jiffry <i>et al.</i> [12]	2005	University of Sri Jayewardenepura	108.0	Sri Lanka
	Mayya and Roff [13]	2004	Kasturba Medical College	107.0	India
	Zaini [14]	2005	Umm Al Qura	107.0	Saudi Arabia
	Al-Hazimi <i>et al.</i> [10]	2004	King Abdul Aziz	102.0	Saudi Arabia
	Al-Hazimi <i>et al.</i> [15]	2004	Sana University	100	Republic of Yemen
	Aghamolaei and Fazel [16]	2010	Iranian Medical Science University	99.6	Iran
	Al-Ayed and Sheik [17]	2008	King Saud University	89.90	Saudi Arabia
Innovative	Varma <i>et al.</i> [18]	2005	Birmingham University	139.0	UK
	Al-Hazimi <i>et al.</i> [15]	2004	Dundee Medical School	139.0	UK
	Riquelme <i>et al.</i> [19]	2009	Pontificia University	127	Chile
	Dunne <i>et al.</i> [20]	2006	UK Medical School	125.0	UK
	Lokuhetty <i>et al.</i> [21]	2010	University of Colombo	115	Sri Lanka
	Tontus [22]	2010	Ondokuz-Mayis University	104.0	Turkey

The focus group sessions were continued until a saturation point was reached and there was a repetition of themes with no new information emerged [25].

### Data Analysis

Focus Group Interviews were audio and video recorded and professionally transcribed for content analysis of the open-ended questions.

Each transcript was analyzed to identify recurring themes. The codebook was initially developed by two investigators (EA and NN), applied, and validated through an iterative process. All collected data items were coded by the two investigators. Differences in coding were reviewed by the researchers and resolved through discussion and consensus.

### Ethical Review

The survey was anonymous. Confidentiality was maintained throughout all phases of study. Only group data were presented. This study was approved by the Institutional Review Board (No. 11/3106/IRB) of KSU College of Medicine.

## RESULTS

The mean total DREEM score of 94.7 out of 200 in this study is relatively low and indicates that the overall response is more negative than positive [Table 3].

### Themes

Four major themes emerged from the qualitative data analyses, namely the overload of curriculum, stress and mentoring,

assessment and feedback and the teaching methods. The factors within the themes contributed to the students' poor perception of the EE. The themes and the potential solutions to remediate them in addition to representative quotes from the students (in italic) are presented below.

### Curriculum

The students complained of the curriculum overload. They requested a reduction in the number of lectures. They repeatedly emphasized that the teachers do not need to cover everything. They preferred that the teachers explain two or three important points and leave the rest of the time for questions and answers and to guide the students on how to study (learn better) the topic.

Student 1 commented:

*Reduce overload of curriculum, less important material should not be taught.*

The student's repeatedly stated that the pressure is too high on the junior student's.

Student 2 commented:

*The 2<sup>nd</sup> year is overcrowded compared with the 3<sup>rd</sup> year. We need appropriate distribution of subjects over study years.*

The students observed that some of their colleagues did not perform well, although they were working hard because they did not know from where to study and how to identify the relevant and important topics. Most of the students expressed their wish to have a course on study skills from the 1<sup>st</sup> year of the school.

**Table 2: Items which were perceived negatively, i.e., score (0 or 1) by more than 50% of students in descending order in the current study**

Item	Domain	% of students with negative perception
There is a good support system for students who get stressed	Social self-perception domain	84.8
I am too tired to enjoy the course	Perception of learning	78.2
I am rarely bored in this course	Social self-perception domain	74.4
The teaching is often stimulating	Perception of learning	73.3
The teaching encourages me to be an active learner	Perception of learning	70.4
The teachers are authoritarian	Teachers' domain	67.2
I feel able to ask all the questions I want	Perception of atmosphere	65.6
The enjoyment outweighs the stress of the course	Perception of atmosphere	65
The atmosphere motivates me as a learner	Perception of atmosphere	64.7
The teaching is too teacher-centered	Social self-perception	62.9
I am able to memorize all I need	Academic self-perception	61.9
The teaching helps to develop my confidence	Perception of learning	61.7
The teaching time is put to good use	Perception of learning	61.3
The teaching helps to develop my competences	Perception of learning	60.4
The teachers are good at providing feedback to the student's	Teachers' domain	59.2
Long-term learning is emphasized over short term learning	Perception of learning	58.1
The teaching is well-focused	Perception of learning	56.2
The atmosphere is relaxed during lectures	Perception of atmosphere	56.2
The teaching over-emphasizes factual learning	Perception of learning	53.2
Cheating is a problem in this school	Perception of atmosphere	52.3
Learning strategies, which worked for me before continue to work for me now	Academic self-perception	51.4
The teachers provide constructive criticism here	Teachers' domain	50.5

**Table 3: Descriptive statistics (mean and SD) of the total Dundee ready educational environment measure scores in the current study**

Academic year	Males	Females	Total score	P value
	Mean total score ( $\pm$ SD)	Mean total score ( $\pm$ SD)	(Mean $\pm$ SD)	
Year	103.56 ( $\pm$ 20.31) (n=163)	107.43 ( $\pm$ 18.17) (n=68)	104.70 ( $\pm$ 19.74)	0.18
2 <sup>nd</sup> year	88.40 ( $\pm$ 22.12) (n=167)	98.20 ( $\pm$ 19.06) (n=51)	90.69 ( $\pm$ 21.80)	0.005*
3 <sup>rd</sup> year	90.17 ( $\pm$ 18.60) (n=179)	95.99 ( $\pm$ 20.78) (n=79)	91.95 ( $\pm$ 19.44)	0.027*
4 <sup>th</sup> year	93.14 ( $\pm$ 21.27) (n=156)	95.08 ( $\pm$ 19.82) (n=74)	93.77 ( $\pm$ 20.79)	0.510
5 <sup>th</sup> year	97.07 ( $\pm$ 24.00) (n=107)	80.46 ( $\pm$ 18.98) (n=54)	91.50 ( $\pm$ 23.60)	0.000*
Total	94.17 ( $\pm$ 21.75) (n=772)	95.94 ( $\pm$ 20.98) (n=326)	94.67 ( $\pm$ 21.53)	0.213

SD: Standard deviation

Student 3 commented about the lack of academic guidance:

*Curriculum should be specified, please provide us with study guides for each course.*

Student 4 commented:

*We want courses on study skills, like reading and note-taking skills during the early years of the college.*

### Stress and Mentoring

Many sources of stress were identified; most of them related to the environment inside the school and the curriculum. The stressors included, very little time for recreation or social activities, poor teaching and fear of exams. Family, income or housing was not considered as important stressors by the students.

Student 5 mentioned:

*We spend very long hours in the college and for each lecture you need to spend at least 2 h to comprehend it. There is not much time remaining for other activities?*

Student 2 stated:

*What increases my stress is too much repetition, monotony in the wards and in the surgery department and distraction by disinterested students.*

Student 6 stated:

*Wastage of time and breaks in clinical years due to lack of punctuality of some of the teaching staff.*

Student 4 mentioned:

*Fear of failure in exams causes much stress. I think that the use of mock exams and frequent quizzes with little or no marks will reduce stress.*

The students were not happy with the shortage of mentors and academic advisors. They mentioned that if there were caring mentors, they could have saved them a lot of time and suffering.

Student 9 commented:

*One advisor should be allocated to no more than 10 students and he or she should help the students not only academically but also socially.*

### Assessment and Feedback

All students in the focus groups acknowledged the need to change the current assessment methods. The students requested to be provided with chances for self-assessment in the form of written questions and their answers and assignments. Furthermore, students requested to have mock practical exams with feedback in the middle of the course to give them a chance for improvement.

Student 8 commented:

*Provide examples of MCQs to allow better preparation for the examination. MCQs should be changed from direct questions to cases (scenario based).*

Student 6 commented:

*Teachers should not encourage us to study for the sake of examinations only.*

*If there is better teaching and frequent evaluation, there will be no need for cheating.*

Student 10 stated:

*Feedback happens much less than what we like, train the faculty to provide feedback. It should be part of clinicians' teaching.*

### Teaching Methods

The students were in general, critical of the teaching methods used, and pointed out what motivates or de-motivates them regarding their learning. They particularly requested to learn their teachers real life experience, to prepare and activate their knowledge before the learning event. They preferred to interact, both during the didactic sessions and in the clinical settings.

Student 5 suggested that:

*Lectures should be used only for guidance; there is no need to cover everything in the lectures. The name and title of the next topic should be announced few days before the lecture to stimulate us to prepare. The theory should be linked to the practical application. Topics should be presented in the form of cases that will stick in our mind.*

Student 6 complained:

*Some teachers are authoritative and humiliating. They should provide us with a respectful environment in order to like their topics and to be able to ask questions or request clarifications.*

Student 3 suggested:

*Teachers should try to reduce the stress during the class to make the course more enjoyable.*

## DISCUSSION

The finding of the mean total DREEM score of 94.67 out of 200 in the quantitative part of the study is alarming and indicates that the overall perception of EE at this school with the traditional curriculum in 2006-2007 was more negative than positive. It is consistent with the general trend of lower DREEM scores among schools with traditional curricula. Moreover, in this study, the mean total score is lower (poorer environment) than most of the studies reported worldwide.

The main areas that require attention in the qualitative part of the study are: (i) Curriculum overload (ii) stress and lack of mentoring (iii) assessment and feedback related issues and (iv) inappropriate teaching methods.

Regarding the curriculum overload, the student's felt that there was little time for meaningful learning of concepts, which led to rote memorization. The student's suggested that provision of study guides and specification of core curriculum could resolve the problem. Study skills courses are important to ease students' progress in the school.

Stress and decreased enjoyment among medical students is known to be caused by curriculum overload. A study by Shaikh *et al.* is in concordance with many of the suggestions by the student's in our qualitative study. It suggested provision of more leisure time activities, better student-faculty interaction, advisory services and peer counseling [26]. An effective support system is needed to meet the evolving needs of today's medical students and to ensure they get the necessary help during their stressful training program. The teachers could provide the student's with a safe and respectful environment, where they are allowed to ask questions and clarify concepts. Mentoring is perceived as an important part of academic medicine and mentors can play a role in providing emotional support, advice,

information, and encouragement [27]. The importance of mentoring is also highlighted in the current study. Health education advice, such as exercise could help student's cope better with the demands of higher education [28]. Shaikh *et al.* also suggested that the provision of mock practice exams and self-assessment tools can reduce the fear of failure and stress [26].

Feedback constitutes a central aspect of learning. The current study found that feedback happened much less often than what students would hope for. Similar to this study finding, Schultz *et al.* [29] reported that medical students want and value feedback on their performance, yet they report the quality and quantity of feedback they receive as low. Higgins *et al.* [30] and Weaver [31] also reported that feedback is valued by the student's, who welcomed constructive comments from their tutors.

Student stated that poor faculty teaching skills contributed to poor EE. The teacher's style of instruction and interaction was too teacher centered, authoritative, and over emphasized factual learning. This is similar to the findings of Al Hazimi *et al.* [10] study, which concluded that teacher's should be trained to improve their teaching skills, both in the clinical setting as well as in the classrooms and learn the skills to provide constructive, meaningful feedback. Experimental studies have shown that periodic formative assessments can enhance learning [32]. Therefore, the faculty training programs in colleges need to give priority to introducing formative assessment and feedback.

## CONCLUSIONS

The current study highlights the reasons for poor perception of EE in teachers centered curricula and offers suggestions to improve the EE.

It is now time to shift to the new constructivist model, where students are placed at the center of the process, actively participating in thinking and discussing ideas, while making meaning for themselves, and the teacher functions in facilitating learning in less directive ways. Teachers may need training in innovative pedagogy with particular emphasis on formative assessment and feedback. A study skills course for students is needed to overcome the obstacles in the process of learning.

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