

# Assessment of the educational environment at the College of Medicine of King Saud University, Riyadh

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## تقييم البيئة التعليمية لكلية الطب بجامعة الملك سعود

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**الخلاصة:** استخدمت الترجمة العربية (التي روجعت في هذه الكلية) لمقياس دندي للبيئة التعليمية DREEM في تقييم البيئة التعليمية في كلية الطب، بجامعة الملك سعود، في الرياض. ووزع أكثر من 500 استبيان، تم تحليل 222 منها. وكانت النتيجة الإجمالية 45.0%؛ حيث كان إدراك الطلاب للعملية التعليمية 40.7%، وإدراك المدرسين 48.2%، وإدراك الأكاديمي الذاتي 46.3%، والجو العام 44.4%، والأوضاع الاجتماعية 46.1%. وكانت درجات طلاب السنة الأولى أعلى من زملائهم في السنوات التالية. كما كانت درجات طلاب المرحلة الأساسية (قبل السريرية) أعلى بشكل كبير من درجات طلبة سنوات الدراسة السريرية. أما جنس الطلاب كمتغير فلم يكن مما يعتد به إحصائياً.

**ABSTRACT** We used an Arabic translation (revised in our college) of the Dundee Ready Education Environment Measure (DREEM) inventory to assess the educational environment at the College of Medicine in King Saud University, Riyadh. Over 500 questionnaires were distributed and 222 were analysed. Scores were: 45.0% overall; 40.7% for students' perception of learning, 48.2% for perception of teachers, 46.3% for academic self-perception, 44.4% for perception of atmosphere, and 46.1% for social self-perception. Scores for first year students were significantly higher than the others. Scores for pre-clinical students were also significantly higher than those of students in clinical years. Sex was not a statistically significant variable.

## Évaluation de l'environnement pédagogique de la Faculté de médecine de l'Université du Roi Saud de Riyad

**RÉSUMÉ** Nous avons utilisé une traduction en arabe (révisée dans notre faculté) de l'inventaire DREEM (*Dundee Ready Education Environment Measure*) pour évaluer l'environnement pédagogique de la Faculté de médecine de l'Université du Roi Saud (*King Saud University - KSU*) de Riyad. Plus de 500 questionnaires ont été distribués et 222 ont été analysés, avec les résultats suivants : score général : 45,0 % ; perception que les étudiants ont de l'apprentissage : 40,7 % ; perception qu'ils ont des enseignants : 48,2 % ; perception qu'ils ont de leur niveau de préparation: 46,3 % ; leur perception de l'ambiance : 44,4 % ; et perception que les étudiants ont de leur vie en société : 46,1 %. Les scores des étudiants de première année étaient significativement plus élevés que ceux des autres. Ceux des étudiants en formation préclinique étaient eux aussi significativement plus élevés que ceux des étudiants en formation clinique. Le sexe ne représentait pas une variable statistiquement significative.

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## Introduction

In adult learning theories, teaching is as much about setting the context or climate for learning as it is about imparting knowledge or sharing expertise [1]. The learning environment has been defined as everything that is happening in the classroom or department or faculty or university [2,3]. Measurement of the medical education environment comprehensively assesses what is happening, or how things are [2]. It is a way of assessing the nature of the educational practice of the school. It also provides a holistic, comprehensive, systematic and detailed picture of the overall state of affairs in the education process [4]. The World Federation for Medical Education singled out the learning environment as one of the targets for what it terms “the conduction of the evaluation of medical education programme” [5].

The Dundee Ready Education Environment Measure (DREEM) inventory was originally developed and validated between 1994 and 1996 by a Delphi panel of nearly 100 medical and health profession educators from several countries who were enrolled in various courses in the Medical Education Centre in Dundee, Scotland. It is intended to be a universal and culture-free inventory.

The DREEM inventory is a validated inventory with proven high reliability and has been used in various countries around the world to assess the educational climate of health professionals and medical schools. It comprises 50 items, divided into 5 subscales:

- students’ perceptions of learning, 12 items, maximum score 48;
- students’ perceptions of teachers, 11 items, maximum score 44;
- students’ academic self-perception, 8 items, maximum score 32;

- students’ perceptions of atmosphere, 12 items, maximum score 48;
- students’ social self-perception, 7 items, maximum score 28.

The total possible score is 200. Each item is scored 0–4 (4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree and 0 = strongly disagree). There are 9 negative items scored in reverse manner; for all items, however, results should be presented so that the higher the score the more positive the reading (more favourable educational environment).

The college of medicine at King Saud University gives a traditional 6-year course: the first year is preparatory (pre-med), the next 2 years are devoted to basic medical sciences and the last 3 are for clinical rotations. These parts are separate and the overcrowded curriculum depends heavily on the use of lectures. All activities are teacher centred with few open discussions or problem-solving sessions. Current annual intake of students is approximately 300.

Though El-Hazmi and Haque reported an enthusiastic attempt to review the curriculum of the medical school [6], there have been no significant changes in the real educational sense since its establishment in 1969. Apart from that report using a modified version of Sheehan’s instrument for assessment of the college environment [6], to our knowledge this is the first study assessing the educational environment of this medical school using DREEM inventory.

Recently the college has started a project to review and reform its curriculum. This current study is one of several undertaken to produce baseline pre-change data. The aim of our study was to assess the educational environment at the college of medicine of King Saud University using the DREEM inventory, and to quantify the differences between students in the 5 years of study

and between male and female students in relation to the total scores and the scores of the 5 domains of the DREEM inventory. We also aimed to identify the gaps and weaknesses in the existing educational environment in order to suggest feasible and appropriate remedies.

## Methods

A copy of the original Dundee Education Environment Measure (DREEM) was obtained directly from the Medical Education Centre at Dundee University, Dundee, Scotland. The currently available Arabic translation of the inventory, prepared in Dundee University, was revised and refined by staff members in our College Medical Education Centre to remove any possible lack of clarity or ambiguity in wording and/or phrasing. The questionnaire was produced in Arabic and English.

A covering letter indicating the purpose of the study, the anonymity of respondents and the optional status of the response was attached to the questionnaire. Students' cooperation was requested and it was made clear that participation was entirely on voluntary basis. We distributed 500 questionnaires randomly through group leaders of each class and the students' affairs office.

## Data management and statistical analysis

Data was entered in MS-Excel and analysed using SPSS, version 11.0. As the study outcome variables (scores of 5 domains and total score) are continuous, they were quantified by mean and standard deviation. Comparison of all mean values with the total scores was done using the Student *t*-test for a single sample. Comparison of mean values of scores between male and

female students was done using the Student *t*-test for 2 independent samples, and the comparison of scores between the 5 study years was done using 1-way analysis of variance, followed by Duncan's multiple range test for pair-wise comparison.

## Results

We had 223 responses from the 500 questionnaires distributed (44.6% response rate); 222 were complete and were analysed, 155 (69.8%) from male students and 67 (30.2%) from females. Considering year of study, 98 (44.1%) students were from basic sciences years (pre-clinical years) and 124 (55.9%) were from clinical years; they included 43 (19.3%) first year, 55 (24.7%) second year, 27 (12.2%) third year, 55 (24.7%) fourth year and 42 (18.9%) fifth year students. The sample of students who returned questionnaires amounted to almost 20% of the total number of students enrolled in the school at the time of the study (22.3% for girls and 18.3% for boys).

The overall score was 89.9/200. All scores were statistically significantly lower than the maximum possible ( $P < 0.0001$ ) (Table 1). The total score for pre-clinical years was 93.8/200 and that for clinical years was 84.9/200. The scores of first year students were significantly higher when compared with their seniors' scores (Table 1).

There was no statistically significant difference between male and female students for the DREEM subscale scores, and in only 3 of the 50 DREEM items (I am encouraged to participate in class; the teachers ridicule the students; last year's work has been a good preparation for this year's work) was the difference statistically significant ( $P < 0.05$ ).

Regarding students' perception

**Table 1 Comparison of Dundee Ready Education Environment Measure (DREEM) scores for medical students at King Saud University according to year of study**

Item	Maximum possible	Sample mean (SD)	t-value	Score (%)					F-value
				1	2	3	4	5	
Total (all items)	200	89.9 (24.2)	-67.8	108.6 <sup>a</sup>	84.3	89.3	85.2	84.6	9.5
SPL	48	19.5 (7.9)	-53.8	25.6 <sup>a</sup>	16.8	19.8	18.1	18.5	10.1
SPT	44	21.2 (6.0)	-56.6	25.5 <sup>a</sup>	20.2	22.4	19.9	19.3	8.9
SASP	32	14.8 (5.0)	-51.1	16.9 <sup>a</sup>	14.1	14.3	14.2	14.8	2.6
SPA	48	21.3 (7.3)	-54.9	25.9 <sup>a</sup>	20.5	20.7	20.0	19.6	6.1
SSSP <sup>b</sup>	28	13.0 (4.2)	-52.9	14.4	12.7	12.7	12.8	12.2	1.8

<sup>a</sup>Significantly different (using Duncan's multiple range test):  $P < 0.0001$  for all items except where indicated.

<sup>b</sup> $P = 0.127$  for academic year.

SD = standard deviation; SPL = students' perceptions of learning; SPT = students' perceptions of teachers; SASP = students' academic self-perception; SPA = students' perceptions of atmosphere; SSSP = students' social self-perception.

of learning, the majority, indicated that teaching was not stimulating, long-term learning was not emphasized, they were not encouraged to be active learners, were not encouraged to participate in class, the teaching time was not put to good use, and teaching was too teacher-centred and over-emphasized factual learning.

Score for students' perception of teachers 48.2% (21.2/44) was the highest obtained. A majority of our students pointed out that the teachers are knowledgeable but not good at providing feedback and constructive criticism to students: they ridicule students, get angry in class and are authoritarian.

Students' academic self-perception score was 46.3% (14.8/32). Only 14.8% of students indicated they were able to memorize all they needed to; 28.3% agreed that the learning strategies they used before were still useful for them. However, more than half agreed/strongly agreed that much of what they learned seemed relevant to a career in medicine and they had learnt a lot about empathy in their profession.

The score for student's perception of atmosphere was 44.4% (21.3/48). It seems that students perceived different teaching

methods differently: while 65.9% agreed that the atmosphere was relaxed during seminars and tutorials, only 24.2% felt relaxed during the ward round, and 39.9% were relaxed during lectures. Only about 25% felt that enjoyment outweighed the stress of study.

Students' social self-perceptions score was 46.4% (13.0/28). Only 3.6% of students agreed that there was a good support system for stressed students; 91.5% agreed/strongly agreed that they had good friends in the school; and 74.0% were too tired to enjoy the course and around 80% admitted that they got bored.

## Discussion

The fact that fewer than 50% of the distributed questionnaire were completed may indicate that students were not keen enough to participate in such studies. Students may not think that the results of such studies would lead to any significant changes in their education. It may also be indicative of student's fears that participation in such studies may adversely affect their results,

perhaps as a reflection of the authoritarian atmosphere in the school.

Our results showed a low overall score on the DREEM inventory: as far as we can verify, a score of 45.0% (89.9/200) is the lowest score reported among published studies using the relatively recently validated DREEM inventory. The only published study result close to ours was from Canada, which reported an overall score of 48.5% [7]. In a report from another Saudi medical school, overall score was 51.1% [8]. All other published studies reported overall mean DREEM scores of 55%–68% (Table 2). Among the subscale scores, students' perception of learning was lowest in our study (40.69%). This is very close to the score of 39.58% reported by Till [7], and comparable to the 45.8% (22/48) reported by Al Hazmi et al. [8]. First year students' overall score and subscale scores were higher than those of senior students; this is similar to the finding in a previous report that students who had been enrolled at the school longer were significantly less

satisfied with the teaching and with the support system for stressed students [9].

In a report from a Thai nursing school, 14.8% of students rated their institution below 50% and generally the scores decreased from the first year to the second year nursing course and increased from the second year to the third and fourth year nursing course in all 5 scales [10]. This decrease may be because first year students are not experienced enough to give a valid report of the educational process. This may be supported by the observation of Till that first year students in particular sometimes gave mixed messages which may have contributed to lower the scores [7]. In some of the areas surveyed by the DREEM inventory, the first year students might not have been too sure how to respond although this might simply mean that the first year students were not (yet) too stressed by their studies. It became clear that the students lost some of the neutrality that they exhibited in the first year and became more critical of the educational environment as they progressed

**Table 2 Comparison of Dundee Ready Education Environment Measure (DREEM) scores at King Saud University (this study) and in other studies**

Year, country [reference]	TP <sup>a</sup>	Score (%)					
		Overall mean	SPL	SPT	SASP	SPA	SSSP
1997, UK [8]	7905	66.2	65.8	65.8	64.3	68.6	65.4
1997, Thailand [12]	236	68.7	–	–	–	–	–
2001, Nigeria [9]	127	59.0	68.8	59.1	65.6	56.3	46.4
2001, Nepal [9]	86	65.0	68.8	59.1	68.8	66.7	64.3
2001–2002, Trinidad [6]	106	55.0	58.3	53.6	58.8	52.2	51.6
2004, Canada [7]	407	48.5	39.6	54.5	46.9	52.1	53.6
2004, Saudi Arabia [11]	450	51.1	45.8	45.5	53.1	47.9	53.5
2005, Saudi Arabia [this study]	222	45.0	40.7	48.3	46.3	4.4	46.3

<sup>a</sup>Total no. participants

SPL = students' perceptions of learning; SPT = students' perceptions of teachers; SASP = students' academic self-perception; SPA = students' perceptions of atmosphere; SSSP = students' social self-perception.

through the programme. It could also be explained by the enthusiasm and the illusion of first year students on successfully gaining entry into medical college. However, a study of Nepalese students reported a trend towards improved perceptions in years 2 and 3 over year 1 as reflected in different DREEM totals from the 3 years [11].

Our study did not show a statistically significant difference between males and females for the total score of DREEM. This is in agreement to that reported by Till from Canada [7] but is contrary to that reported in a study carried out in Argentina in which a statistically significant difference between the sexes was found, with women in general more critical about the quality of teaching and the general climate of the school, especially in the areas of student participation in class and the authoritarian attitudes of teachers. Women reported far less satisfactory social lives than men [9]. Roff et al. from the United Kingdom reported that men had a mean score of 27.6/44 for their perception of teachers while for women this was 33.0/44; overall, the males' DREEM score was 129 and the women's was 135 [9]. In Nigeria, a statistically significance difference between the mean scores of male and female students was reported in only 5 of the 50 items of the inventory [11]. A study from Trinidad found that the mean total score for males was less than that for females (105.39 vs 112.79) [12]. In our study, students' perceptions of learning and its items were similar to those in Till's study [7]. Our students' perception of atmosphere was also in agreement with

that in Bassaw et al. [12]. For the subscale of students' social self-perceptions, a very low proportion agreed that there was a good support system for stressed students, which coincides with the findings of Roff et al [11] and Al Hazmi, Al Hyiani and Roff. [8].

Similar to previous studies [7,9-12], our results indicate a need for the creation of a supportive environment as well as designing and implementing interventions to remedy unsatisfactory elements of the environment if effective and successful learning is to be realized.

The nature of self-reporting of questionnaires imposed some limitations to the conclusions of this study. The validity and accuracy of students' perceptions of their learning and the learning environment has been questioned [13].

## Conclusion

This study indicated widespread and large defects in the educational environment in this school. A larger study may need to be undertaken to verify the above results and conclusions.

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