# Perception of educational environment: Does it impact academic performance of medical students?

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## Abstract

**Objective:** To compare environmental perception as measured by the Dundee Ready Educational Environment Measure of students with high and low academic performance.

**Methods:** This cross-sectional analytical study was carried out at the Gujranwala Medical College, Gujranwala, Pakistan, and comprised medical students. Dundee Ready Educational Environment Measure questionnaire with 50 items was used to determine students' perception of the institutional environment. Academic performance was based on mean percentage of marks obtained in all professional examinations. High achievers with 70% or more marks were compared with low achievers with <70% marks for Dundee Ready Educational Environment Measure scores using unpaired Student's t-test.

**Results:** Of the 180 students, 153(85%) were included. Of them, 35(22.87%) were boys and 118(77.12%) girls. The overall mean Dundee Ready Educational Environment Measure score was 116.13±18.24. As for the subscales, the mean score for 'perceptions of learning' was 27.97±6.0, 25.76±4.6 for 'perceptions of teachers', 18.67±4.05 for 'academic self-perceptions', 27.76±6.03 for perceptions of atmosphere and 15.97±3.0 for social self-perceptions. The mean dream score was 108.51±17.54 among boys and 118.39±17.90 among girls. The mean score for perception of having successful learning strategies was 1.66±0.9and 2.18±0.9 among low and high achievers (p>0.05) and 1.71±0.98 and 2.18±1.1 for ability to memorise all that was needed (p>0.05).

**Conclusion:** Environmental perception of the institution was more positive than negative and better performance in examinations was associated with better academic self-perception and social self-perception in students.

**Keywords:** Academic achievement, Dundee Ready Educational Environment (DREEM) questionnaire, Educational environment. (JPMA 66: 1210; 2016)

## Introduction

The learning environment is how students perceive the climate of an institution. It includes their perception regarding infrastructure of the campus, learning opportunities, teacher's skills and attitudes, their interaction with peers and many other factors.[1]

The learning environment acts as a hidden curriculum with a major impact on student's learning. An excellent environment is reflective of a quality curriculum.[2] Despite the influence of the learning environment on academic achievements of an institution, it is a factor which is difficult to measure, and its true status in the educational cycle remains undetermined. Being a perception of trainees, the learning environment can only be explored subjectively and is difficult to quantify. A study from Japan tried to explore factors of environment that impact on student's learning. Factors identified included persistence of hierarchy and exclusivity, existence of gender issues, overestimation of medical knowledge and skills and underestimation of attitudes, low priority of education in

clinical setting and prevalence of positive and negative role models.[3] Studies have explored the impact of environment perception on student's learning. Pimparyon et al. noted a positive correlation between meaningful learning and scales of educational environment.[4]

In order to make learning environment measurable, Roff et al. developed the Dundee Ready Education Environment Measure (DREEM).[5] This is a 50-item questionnaire that focuses on different aspects of the learning environment. Other tools available for learning environment assessment include Postgraduate Hospital Education Environment Measure (PHEEM),[6] Learner's Perception Survey (LPS)[7] and many others. Ever since its introduction, the DREEM questionnaire has been used in a number of studies in different parts of the world with excellent reliability and validity. A study by Shreemathi S. et al. correlated DREEM score of students with their academic performance and has noted that high achievers have better perception of the educational climate.[8] A survey at the Dow University identified highest DREEM scores in student's academic self-perception, and lowest in learning perception.[9]

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As we in our institution are moving from a traditional to an integrated curriculum with focus on improving our students' learning and understanding, it is imperative to address institutional environmental issues as well. As perceptions of students are effected by their cultural background, religious beliefs and the norms of society they come from, it is pertinent to explore perception of our students which is likely to be different from students of other regions. We also need to explore its impact on their academic performance as this will enable us to help them learn better.

The current study was planned to compare institutional environmental perceptions of students with high and low academic performance in summative examinations and identify factors associated with better academic performance.

## Subjects and Methods

This cross-sectional study was carried out at the Gujranwala Medical College, Gujranwala, Pakistan in February 2015, and comprised medical students. Approval was obtained from the institutional review board. Purposive, non-probability sampling method was used. The sample size was calculated online from Raosoft.com, keeping the margin of error at 5% with 90% confidence interval (CI).[10] Students of fourth and final years who had had exposure to both Basic and Clinical teaching and who had appeared in at least three professional examinations were included. Informed consent was obtained from the participants. Students not willing to participate or with any pending result of a professional examination were excluded.

The tool used for determining the students' perception of environment was DREEM, which determines a student's perception in 5 subscales i.e. perceptions of learning (POL), perceptions of teachers (POT), academic self-perceptions (ASP), perceptions of atmosphere (POA) and social self-perceptions (SSP). Assessment of these subscales is spread over50 items related to different aspects of the educational environment. A respondent has to read each statement and respond to it using 5-point Likert-type scale which is scored as 4 for strongly agree (SA), 3 for agree (A), 2 for uncertain (U), 1 for disagree (D) and 0 for strongly disagree (SD). However, 9 of the 50 items are negative (4,8,9,17,25,35,39,48 and 50) and these are scored as 0 for SA, 1 for A, 2 for U, 3 for D and 4 for SD. The maximum possible score is 200 which corresponds to an excellent environment and the minimum is 0 suggesting a worrying result for an institution.

Environmental perception of students as determined by

DREEM was classified as "very poor" if score was 0-50, "plenty of problems" with a score of 51-100, "more positive than negative" if 101-150 and "excellent" with a score of 151-200.

The survey was conducted in a dedicated session with both fourth- and final-year classes separately. The purpose of the research was explained to the students. Ethical issues along with assurance of confidentiality were explained. Students were given the DREEM questionnaire, and asked to complete the form in an unbiased manner according to their own views or perceptions. Basic information like gender and area of residence (rural or urban) were sought. A total of 50 minutes were given with approximately 1 minute for each item. DREEM score was calculated for each student.

Academic record of each student included in survey was obtained from the examination department after proper written permission from the controller of examinations with maintenance of full confidentiality. Students with cumulative percentage of marks in all professional examination of 70 or above and all examinations cleared in the first attempt were classed as high achievers, while those with cumulative marks less than 70% or failure to succeed in the first attempt in any subject of the professional examinations were classified as low achievers.

Consistency or reliability of DREEM questionnaire for the study group was calculated using Cronbach's alpha.

SPSS 20 was used for data analysis. Confidentiality was ensured as data entry of students' results was done by the researcher himself using allocated numbers of each student without mentioning names.

DREEM scores were grouped into 4 grades: poor, plenty of problems, more positive than negative, and excellent, as defined in operational definitions. Variables like gender are presented as percentages. Quantitative variables like DREEM score, its subscales and individual items were given as mean ± standard deviation (SD). DREEM scores of high and low achievers and male and female students were compared using unpaired two-tailed Student's t-test for normally distributed variables while Mann-Whitney U test for non-parametric items of DREEM survey.

## Results

Of the 180 students, 153(85%) were included as 17(9.4%) did not meet examination selection criteria while 10(5.5%) were absent. Moreover, 35(23%) of the participants were boys and 118(77%) girls. There were 70(45.8%) fourth-year and 83(54.2%) final-year students. The overall mean DREEM score was 116.13±18.24 (range:

**Table-1:** Comparison of male and female participant's DREEM scores.

| Scale | Male participants (n- 35) Mean ± SD | Female participants (n-118) Mean ± SD | P value |
|---|---|---|---|
| DREEM score | 108.51(±17.54) | 118.39 (±17.90) | 0.005 |
| Perception of learning | 24.97 (±5.79) | 28.86 (±5.8) | 0.001 |
| Perception of teachers | 23.09 (±4.85) | 26.55 (±4.2) | <0.001 |
| Academic self-perception | 18.4 (±4.45) | 18.75 (±3.94) | 0.65 |
| Perception of atmosphere | 27.03 (±5.84) | 27.97 (±6.09) | 0.41 |
| Social self-perception | 15.03 (±2.54) | 16.25 (±3.08) | 0.034 |

DREEM: Dundee Ready Educational Environment Measure.
SD: Standard Deviation.

**Table-2:** DREEM Items with poor perception of students.

| | Sub-scale | Mean score | Standard Deviation |
|---|---|---|---|
| There is good support system for students who get depressed | SSP | 1.18 | 1.05 |
| I am too tired to enjoy the course | SSP | 1.71 | 1.05 |
| The teachers are authoritarian | POT | 1.39 | 1.001 |
| I am rarely bored in this course | SSP | 1.95 | 1.19 |
| Cheating is a problem in this course | POA | 1.99 | 1.22 |
| The teaching over-emphasizes factual learning | POL | 1.77 | 0.91 |
| Last year work has been a good preparation for this year's work | ASP | 1.63 | 1.19 |
| Teachers are good at providing feedback | POT | 1.98 | 1.27 |
| The teachers get angry in teaching sessions | POT | 1.88 | 1.12 |
| My problem solving skills are being developed | ASP | 1.91 | 0.94 |
| Teaching is too teaching centred | POL | 1.70 | 1.02 |

DREEM: Dundee Ready Educational Environment Measure
POL: Perception of learning
POT: Perception of teachers
ASP: Academic self-perception
POA: Perception of atmosphere
SSP: Social self-perception
SD: Standard deviation.

**Table-3:** Comparison of subscales of DREEM between high and low achievers.

| Scale | Low achievers (n- 47) (Mean score ± SD) | High achievers (n- 106) (Mean score ± SD) | P value |
|---|---|---|---|
| DREEM score | 115.5 (20.62) | 114.92 (16.6) | 0.86 |
| Perception of learning | 27.95 (6.95) | 27.26 (5.3) | 0.54 |
| Perception of teachers | 27.13 (5.04) | 24.98 (4.47) | 0.01 |
| Teachers ridicule students | 2.79 (0.81) | 2.28 (1.01) | 0.008 |
| Good communication with patient | 3.21 (0.57) | 2.86 (0.92) | 0.013 |
| Students irritate teachers | 2.45 (1.26) | 1.76 (1.28) | 0.007 |
| Academic self-perception | 17.29 (3.1) | 19.05 (4.27) | 0.02 |
| Learning strategies continue work | 1.66 (0.9) | 2.18 (0.9) | 0.007 |
| Can memorize all I need | 1.71 (0.98) | 2.18 (1.1) | 0.02 |
| Perception of atmosphere | 28.42 (6.45) | 27.26 (4.42) | 0.3 |
| Social self-perception | 14.71 (3.58) | 16.38 (2.66) | 0.005 |
| Good friends in course | 2.71 (1.1) | 3.3 (0.88) | 0.01 |
| Seldom feel lonely | 2.03 (1.4) | 2.54 (1.15) | 0.03 |

DREEM: Dundee Ready Educational Environment Measure
SD: Standard deviation
Mann Whitney U test.

Cumulative percentage of scores was less than 65% in 6(3.9%) students, between 65-69.9% in 41(26.8%), between 70% and 75% in 85(55.5%) and above 75% in 21(13.8%) participants. Examination score was less than 70% among 47(30.7%) students (low achievers) while 106(69.3%) had a score of 70% or above (high achievers).

The value for consistency or reliability of DREEM questionnaire was 0.89 for low-achieving students and 0.83 for high-achieving students. The mean DREEM score was 115.5±20.62 among low achievers and 114.92±16.6 among high achievers (p=0.86). The mean score for academic self-perception was 17.29±3.1 and 19.05±4.27 among low and high achievers (p=0.02) and for social self-perception it was 14.71±3.58 and 16.38±2.66, respectively (p= 0.005). The mean score for perception of teachers was 27.13±5.04 among low and 24.98±4.47 among high achievers (p=0.01).

The mean score for perception of having successful learning strategies was 1.66±0.9 and 2.18±0.9 among low and high achievers (p=0.007) and 1.71±0.98 and 2.18±1.1 for ability to memorise all that was needed (p=0.02). The values for having good friends in the course was 2.71±1.1 among low and 3.3±0.88 among high achievers (p=0.01) and 2.03±1.4 and 2.54±1.15 for seldom feeling lonely (p=0.03). The mean score for the perception about teachers ridiculing students was 2.79±0.81 and 2.28±1.01 among low and high achievers (p=0.008) and 2.45±1.26 and 1.76±1.28 for students irritating teachers (p=0.007) (Table-3).

64 to 151). Besides, 26(17%) students evaluated the educational environment to have a lot of problems, 126(82.4%) found it more positive, while 1(0.7%) regarded it as excellent.

As for the subscales of DREEM, the mean score for POL was 27.97±6.0 (maximum score: 48), 25.76±4.6 (maximum score: 44) for POT, 18.67±4.05 (maximum score: 32) for ASP, 27.76±6.03 (maximum score: 48) for POA and 15.97±3.0 (maximum score: 28) for SSP. The mean dream DREEM score was 108.51±17.54 among boys and 118.39±17.90 among girls (p=0.005) (Table-1). DREEM items with poor perception of students were noted separately (Table-2).

## Discussion

Forces of environment start influencing the growth and development of individuals right from the womb of the mother. Once the process of learning starts, educational development occurs in physical, social, cultural and psychological environments.[11]

The educational environment is what the students perceive. DREEM inventory has remained instrumental in efforts for making environment learner-friendly. Sundus A. et al, in a survey of medical students, have used DREEM for identifying deficient elements of environment to make it on a par with students' expectations.[12] But which factors can affect student's learning, the prime goal of educational activity, can only be gauged by evaluating performance of students in summative assessment in background of their environmental perceptions.

Our study revealed that students perceive the climate of our institution as more positive than negative with a mean DREEM score of 116. A study conducted in Karachi found DREEM score at 117 ± 8.3.[13] Many national and international studies have revealed similar scores.[14,15]

Female students had better perception of the institutional environment which is important considering the fact that girls constitute over 70% of our medical students. An Australian study also noted better DREEM score of 138.8±17.2 among girls compared to 132.3±20.7 among boys.[16]

Student-centred education pivots on improving students' perception of the environment. Its importance lies in its impact on the academic performance.[17] Chinthamitr et al. concluded that perception of positive training environment influences the performance of residents in terms of examination scores.[18] Positive learning environment can result in better student satisfaction, achievement and success.[19] No significant difference was noted between DREEM score of high and low achievers in our study. But on detailed subscale analysis, we identified higher scores in academic self-perception and social self-perception to be associated with higher examination scores. Al-Ansari AA et al. identified that improvement in learning perception is associated with higher grades while perception of problems in the environment and social life results in underperformance.[17] Sajid et al. identified better social life as a major factor contributing to students' academic performance.[20] Organisational factors, motivational factors, teacher's involvement in study and social factors were identified as major factors contributing to students' achievement in a study by Kamruddin et al.[21] Another study noted the positive association of perception of teachers, academic atmosphere and social self-perception with achievements in academics.[8]

As we noted, better scores in academic self-perception and social self-perception were linked to better examination results. Items of these subscales with mean scores less than 2 and significantly lower scores among low achievers need attention. Efforts to improve these factors will enhance the academic performance of students.

Development of problem solving skills and enhancing contribution of previous learning in new knowledge acquisition are items of academic self-perception which are found deficient in learning environment by our students, especially those with lower scores. Our medical institutions need to adopt an integrated curriculum where teaching revolves around themes and problems, and learning and teaching are viewed as an interactive activity with active contribution by students.[22] Fostering problem solving skills will enable students to approach their patients more holistically. Teachers need to focus on a constructivist approach to learning where new knowledge builds on existing knowledge.[23] Learning is a process of transforming and reorganising existing knowledge and the teacher's role is more as a facilitator who promotes critical thinking, problem-solving and reflection thus helping students in becoming self-directed learners.[24] It will also promote development of better learning strategies and enhanced memory, areas perceived as deficient by low achievers in our study.

Similarly, as noted in the subscale of social self-perception, making course work interesting and lively for students and establishment of support systems in the institution for solving academic, social, economic and personal issues of students will lead to better academic results. It will also solve the issue of loneliness and lack of friends as noted in low achievers of our study. A study from the Foundation University Medical College identified the need for establishing student support system to serve as mentors for guidance in learning, especially while implementing curricular integration.[25] No teacher alone can handle all the issues faced by students during their learning.[26] Promotion of collaborative learning by giving tasks and assignments to students as a group will foster teamwork, social interaction and social self-perception.

Focus of the majority of educational interventions is either curriculum planning or introduction of new assessment tools as these are presumed to be major determinants of student's learning. Relation of various environmental and psychological factors with the academic achievement of students is a relatively new

territory, and as educationist we need to direct our efforts at improving these factors as well to make learning productive and enjoyable for our students.[27]

## Conclusion

Environmental perception of our institution was more positive than negative and better performance in examinations was associated with better academic self-perception and social self-perception in students.

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**Conflict of Interest:** None.

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