Original Research Article

Students' Perception of Educational Environment in an Indian Medical School Using DREEM Inventory

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Abstract

Introduction: Students' perception of the environment within which they study has been shown to have a significant impact on their behaviour, academic progress and sense of well-being. The study, by way of student perceptions recorded on the Dundee Ready Educational Environment Measure (DREEM) inventory, reveals the strength & weakness of educational environment at our institute. This understanding can be aided for refining the learning environment. **Method:** Perceptions of students recorded by DREEM inventory alynonymous and mean global scores and domain scores were expressed as mean + standard deviation (SD). Result was recorded gender wise and the difference in the result of male and female compared using rank sum test to see if the difference between the perception is significant or not. **Result:** Students' Perceptions of Learning: The mean domain score was 31.40/48 (SD 4.63) Students' Perceptions of Teachers: The grouped mean SPT score was 28.24 /44 (SD 4.63) Students' academic self-Perceptions: The grouped mean score was 22.05 /32 (SD 4.9) Students' Perceptions of Atmosphere: The grouped mean score was 31.30/48 (SD 5.5) Students' Social Self-Perceptions: The grouped mean SSP score was 17.70/28 (SD 3.9). Female students indicated a more positive perception of their environment than did males on almost all aspects. **Conclusion:** Study using DREEM inventory revealed problematic areas of learning environment in our medical school, which help us in deciding priority areas for reform of educational environment.

Key words: *DREEM, Educational Environment, UG medical students, India*

INTRODUCTION

Educational environment, synonymous with the climate, or atmosphere, or ethos, or tone, or ambience, is multifaceted and can be described as an educational institution's personality, spirit, and culture. Curriculum generates & establishes environment [1].

Students' perception of the environment within which they study has been shown to have a significant impact on their behaviour, academic progress and sense of well-being [1, 2, 3,4]. Even changing the physical structure of a classroom is one way to alter the environment of a classroom and influence on students' perception. A conducive educational environment will result in positive learning outcomes. The quality of the educational environment reflects the quality of the curriculum [1]. Bassaw et al. have pointed out that the educational environment as perceived by students is one of the most central components influencing the accomplishment of a successful curriculum [5].

Ours is traditional Indian Medical School, where Undergraduate curriculum is teacher cantered, discipline based, information gathering and hospital based with no options or elective modules. The main part of the curriculum consists of lectures, tutorials and practical classes with no problem-based sessions.

Many researchers have focused on the role of learning environment in undergraduate medical education and investigative perceptions of educational environment in the recent years. The Dundee Ready Education Environment Measure (DREEM) is an instrument, robust, generic, multi-cultural & multidimensional, designed for measurement of educational climate specifically for undergraduate medical education [6]. The DREEM (Dundee Ready Educational Environment Measure) questionnaire [6] is specific to the unique environment experienced by students on medical and healthcare-related courses. This instrument was developed by an international Delphi panel, and has been applied to a number of undergraduate courses for health professionals worldwide [7]. The medical profession, largely through the Dundee Ready Education Environment Measure (DREEM) [6], has been able to apply a much greater degree of empirical introspection when it comes to the learning environments of its

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students. So with DREEM inventory we decided to take a snap shot of educational climate of our institute.

Therefore, the aim of this study is to evaluate, by way of student perceptions recorded on the DREEM inventory, the overall education environment which will reveal strength & weakness of curriculum at our institute. The study also investigates aspects of educational environment as perceived in terms of gender. This understanding can be aided with ultimate aim of refining the learning environment by analysis of the processes and the decision to change. DREEM questionnaire is an ideal chance for students to exclaim their opinions about their dreamed educational climate.

MATERIALS AND METHODS

Present study was undertaken after obtaining permission from institutional head. Participants received an explanatory statement detailing the study and were informed that all data collected would be de-identified so that their involvement remained anonymous. Participants' consent to take part in the study was inferred by their completion of the questionnaire. DREEM Questionnaire, which has universal face validity[4,7] and high reliability,[6,8] has been used to assess the learning environment as perceived by students[4,7] This questionnaire has identified the perceived weaknesses of a new curriculum[3] and has been used to compare the educational environment in two different curricula.[7,9]

The DREEM is 50 items, self-administered, Likert type inventory divided into 5 domains which are

1) *Students' Perceptions of Learning* (SPL) - 12 items (max. Score 48);

2) *Students' Perceptions of Teachers* (SPT) - 11items (max. score 44);

3) *Students' Academic Self- Perceptions* (SAP) - 8 items (max. score 32);

4) *Students' Perceptions of Atmosphere* (SPA) - 12 items (max. score 48);

5) *Students' Social Self-Perceptions* (SSP) - 7 items (max. score 28).

The total score for all domains is 200. Each item is scored from 0–4 with 4 = strongly agree; 3 = agree; 2 = unsure; 1= disagree; 0 = strongly disagree. Reverse scoring is required for items 4, 8, 9, 17, 25, 35, 39, 48 and 50 (Annexure 1).

Higher scores indicate a more positive evaluation. Depending on DREEM questionnaire student perception on educational environment items are subdivided in 5 subscales. These subscales give opportunity to researcher to specify weaknesses or strengths of program/course. Roff et al., (1997) indicates that individual items with a mean score of 3 and above reflect a positive educational climate and are considered areas of strength for a school; and items with a mean score below 2 are considered areas of weaknesses for a medical school. Items with a mean score between 2 and 3 reflect areas that are neither strengths nor weaknesses but identify areas that could be enhanced.

The mean global scores and domain scores were expressed as mean +standard deviation (SD). Result was recorded gender wise and the difference in the result of male and female compared using rank sum test to see if the difference between the perception is significant or not.

RESULTS

Response Rate and Sample Characteristics

Eighty six student of third professional term completed the inventory (86/100, 86%). There were 47 male (70%) and 39 female respondents (30%).

Reliability of Instrument

The analysis of internal consistency of DREEM items was conducted using the overall and domain scores. A minimum coefficient alpha of 0.70 was used to indicate an adequate level of internal consistency for the domain scores.33 each of the 50 items on the DREEM was correlated with the overall score for the scale and alpha values were computed with each item removed. The overall reliability coefficient alpha was 0.912 and domain scores surpassed the 0.70 threshold, except for SAP.

Overall and Domain Scores

The overall mean score was 131.65 out of 200 (65.82%). As shown in Table 1, the total highest mean score for an individual item was 3.4 (items 15, 19, 44, 45 and 46), item 9 was scored minimum with < 2.0, 20 items were scored between 2 to 3 and 29 items were scored more than or equal to 3 (Table 2). The highest overall mean score was 183 (SD 16.34) and the lowest overall mean score was 84 (SD 16.34).

SAP and SPL generated the highest individual domain scores conversely SSP and SPT produced the lowest individual domain scores. The overall and domain scores are presented in Table 1.

Students' Perceptions of Learning: The mean domain score was 31.40/48 (SD 4.63; Table 1). The study population perceived no problem area in this subscale. Some areas were perceived as requiring enhancement.

Students' Perceptions of Teachers: The grouped mean SPT score was 28.24 /44 (SD 4.63; Table 1).

Table 1: Scores obtained for subscales (Mcaleer & Roff) by the study populations

	Max score	Sample Mean	High-est	Low-est	Male	Female	Categorization of sub scale	Male (%)	Fe-male (%)
All items	200.00	131.65	168.00	44.00	126.34	135.03			
							Very poor	2.13	0.00
							Plenty of prob-lems	6.38	0.00
							More positive than negative	82.98	76.92
							Excellent	8.51	23.08
Students' perception of learning	48.00	31.40	43.00	18.00	29.97	32.82			
							Very poor	0.00	0.00
							Teaching is viewed negatively	17.02	2.56
							A more positive perception	82.98	94.87
							Teaching highly thought of	0.00	2.56
Students' percep-tions of teachers	44.00	28.24	39.00	18.00	27.89	28.59			
							Abysmal	2.13	0.00
							In need of some re-training	12.77	10.26
							Moving in the right direction	70.21	71.79
							Model teachers	14.89	17.95
Students' academic self perception	32.00	22.05	31.00	12.00	21.17	22.92			
							Feelings of total failure	2.13	0.00
							Many negative as-pects	8.51	7.69
							Feeling more on the positive side	68.09	53.85
							Confident	21.28	38.46
Students' perception of atmos-phere	48.00	31.30	45.00	13.00	29.95	32.64			
							A terrible environ-ment	0.00	0.00
							There are many is-sues which need changing	14.89	7.69
							A more positive atmosphere	72.34	66.67
							A good feeling overall	12.77	25.64
Students' social self perception	28.00	17.70	26.00	12.00	17.34	18.05			0.00
							Miserable	0.00	0.00
							Not a nice place	14.89	10.26
							Not too bad	74.47	82.05
							Very good socially	10.64	7.69

They positively perceived their teachers as, knowledgeable, whilst 'teachers are authoritarian' as a problem.

Students' academic self-Perceptions: The grouped mean score was 22.05 /32 (SD 4.9; Table 1). Statistical significance was seen in item "I am able to memorize all I need" with more positive response in female participants. Not being able to memorize all they need, learning strategies need change and relevancies of their learning were perceived as areas requiring enhancement in this subscale.

Students' Perceptions of Atmosphere: The grouped mean score was 31.30/48 (SD 5.5; Table 1). There were statistically significant differences between both groups in two item (item no. 17, 34). No problem areas were identified in this subscale indicating a positive atmosphere.

Students' Social Self-Perceptions: The grouped mean SSP score was 17.70/28 (SD 3.9; Table1). Statistical significance was seen in item no.3 where study group agreed they had problems with the support systems available for those who get stressed. But same was perceived more positively by female students. Accommodation was perceived to be pleasant by both genders. Female students expressed more agreement with a significant difference among the genders for having a good social life ($p<0.05$) but score was lower in perception "I seldom feel lonely" ($p<0.05$). Problem areas identified by male were 'being too tired to enjoy the course' and 'being bored'.

DREEM result was also analysed as suggested by McAleer and Roff32 (Table 1).

Gender

The total mean score was 126.34 (SD 16.7) for males and 135.03 (SD 23.5) for females. When perceptions of male & female were compared in the all five domains using rank sum test, significant differences were detected in five items out of 50. When individual items were analyzed, females scored higher in all 5 domains, except in 7 items (37, 39, 50, 35, 49, 14, and 28)

The difference was statistically significant among the two genders for the questions 'I am able to memorize all I need' ($p=0.002$), my problem solving skills are being well developed here ($p=0.02$) in students academic self-perception, 'cheating is problem here ($p=0.04$)' and the atmosphere is relaxed during seminars/tutorials' ($p=0.027$), in the students' perception of atmosphere sub scale and 'there is good support system for student who get stressed' (0.023) in students social self-perception subscale.

DISCUSSION

An educational environment of any institute is perception of its student to diverse physical locations, contexts, and cultures which students perceive. Collected data through DREEM questionnaire has provided an overview of students' opinion of educational environment, what they perceived during three years of their study in medical school.

This is the first study to report results of educational climate perceived by undergraduate medical school students from the Gujarat-India. The DREEM questionnaire was found to be an important instrument for this qualitative measurement.

Students were interested in completing the inventory as evidenced by the good response rate. The overall mean DREEM score for our medical school was found to be 131.65/200 (n = 86), indicating that, students' perceptions were more positive than negative. The DREEM global scores for medical schools in Srilanka, Nepal, Nigeria and UK were reported as 108/200[8], 130/200, 118/200[9], and 139/200[10] respectively. The mean DREEM score for a medical school in India was reported as 107.44/200[11]. In our sample, the score for all the five domains of DREEM indicated a more positive perception by both gender.

While taking the individual items into consideration, only one items for which the students scored less than 2 was from domain of Students' Perceptions of Teachers (item 9) Students felt that teachers were very strict. Six items were rated positively by the students in their perception about teacher. They felt that teachers are knowledgeable, well focused, and prompt in providing feedback to the students. They are well prepared for clinical training & are able to communicate effectively with the patients.

Perception of academic learning environments by gender

Female students indicated a more positive perception of their environment than did males on almost all aspects. Females scored more negatively than males in regards to 7 items like " Teachers give clear example, Teacher get angry in teaching session, Students irritate the course organiser, I find the experience disappointing, I feel able to ask the question I want, I am rarely bored on this programme, I seldom feel lonely." Similar result was observed at Melaka Manipal Medical College in India[12].

5 items (Table 2) were found to have significant difference ($p < 0.01$) between both genders. All five items (from all domains) (items 27, 41, 17, 34 and 3) were

rated higher by the Female students. Mayya SS reported low total DREEM score for female academic under-achievers compared to their male counterparts in a study conducted at an Indian medical school[11]. In a study reported by Hettie Till [13], the mean DREEM scores were lower for female students compared to the males.

Item 'I am able to memorize all I need' show significant difference can be due to the fact that Students are stressed by memorization of too many facts. The present course might be focusing on the retention of too many facts rather than the attainment of practical skills. Davis[14] has pointed out that to improve understanding and preserve what has been learned, teaching has to move away from rote memorization and passive learning and promote active and deeper approaches of learning and endorse engagement of students.

Some of the statistically significant gender differences observed with high score of female, at our institute could be due to more supportive interpersonal relationships/empathetic behaviours among females in the study population. The study results indicate that the males require more support to develop competence, empathy, interpersonal skills and a good social life in comparison to females at our institute. Australian study, which investigated the perceptions of mainly applied science students, found that males and females perceived their courses in an almost identical way [15]. In present study also, except for five items on all other aspects males and females perceived their courses in an almost identical way.

Table 2: Item gender scores, p values of item gender scores and item mean scores

	Statement	Male	Female	p Value	Total
	Students' perception of learning:				
1	I am encouraged to participate during teaching sessions	2.7	2.7	0.49	2.7
7	The teaching is often stimulating	2.5	2.7	0.28	2.7
13	The teaching is student centered	2.5	2.6	0.33	2.7
16	The teaching helps to develop my competence	2.9	3	0.59	3.1
20	The teaching is well focused	2.7	2.9	0.4	3
22	The teaching helps to develop my confidence	2.8	2.8	0.97	3.1
24	The teaching time is put to good use	2.7.	2.8	0.42	3
25	The teaching over emphasizes factual learning	2	2.1	0.46	2.3
38	I am clear about the learning objectives of the program	2.7	2.9	0.3	3.2
44	The teaching encourages me to be an active learner	2.8	3	0.31	3.4
47	Long term learning is emphasized over short term learning	2.3	2.5	0.26	2.9
48	The teaching is too teacher centred	2	2.4	0.11	2.8
	Students' perception of teachers:				
2	The program organizers are knowledgeable	3.1	3.1	0.9	3.1
6	The course organizers espouse a patient centered approach to consulting	2.4	2.6	0.66	2.6
8	The teachers ridicule the registrars	2	2.3	0.11	2.2
9	The teachers are authoritarian	1.6	2	0.71	1.8
18	The teachers have good communication skills with patients	2.9	3	0.67	3.1
29	The teachers are good at providing feedback to students	2.8	2.9	0.59	3.2
32	The teachers provide constructive criticism here	2.6	2.6	0.86	2.9
37	The teachers give clear examples	2.9	2.8	0.41	3.3
39	The teachers get angry in teaching sessions	2.6	2.5	0.91	3
40	The teachers are well prepared for their teaching sessions	2.9	2.9	0.87	3.3
50	The students irritate the course organizers	2.3	2.1	0.44	2.8

Table 2 Continued in next page. P.T.O

Table 2 (Continued): Item gender scores, p values of item gender scores and item mean scores

	Statement	Male	Female	p Value	Total
	Students' academic self-perception:				
5	Learning strategies which worked for me before continue to work for me now	2.3	2.6	0.07	2.5
10	I am confident about my passing this year	3.1	3.2	0.27	3.3
21	I feel I am being well prepared for my profession	2.8	3.1	0.11	3.2
26	Last year's work has been a good preparation for this year's work	2.7	2.9	0.45	3.1
27	I am able to memorize all I need	2.4	2.5	0.002	2.8
31	I have learnt a lot about empathy in my profession	2.7	3	0.95	3.2
41	My problem solving skills are being well developed here	2.6	2.7	0.02	3.1
45	Much of what I have to learn seems relevant to a career in healthcare	2.8	3	0.39	3.4
	Students' perception of atmosphere:				
11	The atmosphere is relaxed during consultation/clinic teaching	2.5	2.6	0.29	2.7
12	This program is well timetabled	2.7	2.9	0.5	2.9
17	Cheating is a problem on this program	2	2.2	0.04	2.3
23	The atmosphere is relaxed during lectures	2.4	2.5	0.67	2.7
30	There are opportunities for me to develop interpersonal skills	2.7	3.1	0.06	3.2
33	I feel comfortable in class socially	2.8	3.1	0.12	3.3
34	The atmosphere is relaxed during seminars / tutorials	2.4	2.9	0.027	3.1
35	I find the experience disappointing	2.7	2.5	0.9	3
36	I am able to concentrate well	2.5	2.8	0.11	3
42	The enjoyment outweighs the stress of the program	2.5	2.6	0.68	3.1
43	The atmosphere motivates me as a learner	2.3	2.7	0.09	3
49	I feel able to ask the questions I want	2.6	2.4	0.78	3.1
	Students' social self-perception:				
3	There is a good support system for students who get stressed	2	2.5	0.023	2.3
4	I am too tired to enjoy the course	1.9	2.2	0.36	2.1
14	I am rarely bored on this program	2	1.8	0.47	2.06
15	I have good friends on this program	3.3	3.3	0.62	3.4
19	My social life is good	3	3.3	0.19	3.4
28	I seldom feel lonely	2.2	1.9	0.41	2.3
46	My accommodation is pleasant	2.9	2.9	0.62	3.4

The male students' perception with borderline score of 2 was observed in items as below.

- 'Teaching over emphasize factual learning': This may also be broadly rooted in their acquired study habits of having emphasized factual learning for the entry level examination. Students' perception of accentuated factual learning can also be conferred in the context of assessment methods used, since it is well recognized that assessment has the propensity to drive learning[16]. It may be possible to overcome these problems by redesigning the foundation course at entry level to address these issues as recently suggested by Medical Council of India
- 'Teaching is too teacher centered.' This perception may be because students are more critical about quality of teaching, especially in areas of student participation in class.
- 'There is good support system for students who get stressed.' As students are exposed to a diversity of pressures, many of which

Table - 3: Comparison of sample mean score of the study population with Other Institutional studies

DREEM & its subscales	GMCB Sample mean score Percentage %	DU[13] Sample mean score Percentage %	BPKI HSN[19] Sample mean score Percentage %
All items(/200)	131.65 65.82%	139 69.50%	130 65.00%
Students' Perceptions of Learning (SPL - / 48)	31.40 65.40%	34 70.83%	33 68.75%
Students' Perceptions of Teachers (SPT- / 44)	28.24 64.18%	29 65.91%	26 59.09%
Students' Academic Self- Perceptions (SAP-/ 32)	22.05 68.89%	23 71.88%	22 68.75%
Students' Perceptions of Atmosphere (SPA- /48)	31.30 65.19%	35 72.92%	32 66.67%
Students' Social Self-Perceptions (SSP- / 28)	17.70 63.19%	20 71.43%	18 64.24%

GMCB= Govt. Medical College Bhavnagar, Gujarat- India, DU=University Of Dundee, BPKIHSN= BP Koirala Institute of Health Sciences, Nepal

may cause stress. [17] Guthrie et al[18] reported that, up to 50% of students' stress is related to aspects of the course work. Bassaw et al[5] have argued that students must be supported all the way through the educational path, from entering school to qualifying and beyond.

- 'Teacher ridicule the registrar'
- 'Cheating is a problem on this programme.'

It is difficult to execute a comparative analysis on some moral or ethical issues because this issue is highly dependent on local context, cultural differences, and unrecognized confounding factors.

The overall perception of the educational environment at our institute was more positive, the global mean score of the study sample was lower than what was observed in studies from University of Dundee and higher than Faculty of Medical Sciences, University of Sri Jayawardenapura in Sri Lanka and was similar to the study results from BP Koirala Institute of Health Sciences in Dharan Nepal

A percentage mean score of 65.40% for students' perception of learning, 64.18% for students' perception of teachers, 68.89% for students' academic self-perception, 65.19% for students' perception of atmosphere, and 63.19% for students' social self-perception subscales were obtained of the study population. A comparison of the percentage mean scores of subscales of study population with the other studies is depicted in Table 3.

Overall score was positive (65.82%) Apart from the existence of a good educational environment, the overall high score may also be attributed to small institution. Highest score among five domain was seen in student academic self-perception (68.89%), followed by student perception of learning (65.40%) & lowest score was observed in student social self-perception (63.19%). Interestingly, these is opposite to other studies. (16, 27, 36, 39, 40)Hence, they can be generically weak areas of educational environment.

However, the low student scores for the domain *Social Self-Perceptions* reveal this to be an area of weakness necessitating rectification. Tiredness of students with course may be due to tediousness of the long course with high expectations from them. Further despite the high score on issues like having good friends & good social life, students still feel lonely. These emerged as areas of concern.

Effective feedback is a renowned catalyst for effective learning, especially for average or poor performers. Feedback should be given in a way that "helps the recipient to listen to it, receive it constructively, reflect on it, and consider how to take action as a result, items regarding this (29,32) shows score 3.2 and 2.9 respectively suggesting that feedback is positive aspect but there is scope of enhancement in constructive criticism. Constructive and effective feedback techniques should be reinforced through faculty development programmes so as to influence attitudes as well as skills. Formative feedback should be task oriented, simple and timely, provided by the appropriate person, in a friendly non-threatening climate and involve praise alongside constructive criticism and corrective advice [20,21, 22].

In the present study, the sample mean score of all the five domains

of DREEM pointed to more affirmative perceptions of environment by all students, except one item that 'Teachers were authoritarian' which received poor score, indicating cause for concern. Similar concerns and findings have been raised in other studies as well.[23,24, 25].

LIMITATIONS

It is clear that such questionnaires cannot tell the whole story there is the risk of leaving out some elements of an explicit context. DREEM creates an instantaneous portrait of student perception of their educational study climate, but cannot give specific data about the concerns underlying poor scores. Using qualitative methods could have been useful to recognize areas not captured within the quantitative instrument that necessitate remediation.

The method we have used is subjective and dependent on student's recollections of experiences from the previous or current year; however, these perceptions will inevitably have some relation to actual faculty and student behaviour.

Finally, given the nature of the study, there is a risk of the students not being honest to protect themselves and their peers and to avoid speaking against their teachers. More information may have been revealed with the use of focus groups or independent one-to one interviews.

CONCLUSION

Learning environment affects student motivation and achievement, so it is important to get feedback from the students on how they perceive their learning environment. This batch of medical undergraduates comprising the study population at our institute, perceived their educational environment to be more positive. Nevertheless, the study also revealed problematic areas of learning environment in our medical school (as the mean score of many items were between 2 and 3 suggesting scope of enhancement) which can enable us to adopt some remedial measure & to ensure and maintain high quality educational environments and recheck students' standpoint. Thus, DREEM can be used to diagnose areas requiring priorities for reform of educational environment.

ACKNOWLEDGEMENTS

We wish to thank students who gave their time to participate in the study.

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