



PERCEPTION OF MEDICAL STUDENTS TOWARDS EDUCATIONAL ENVIRONMENT AND ITS EFFECT ON LEARNING

Dr. Mrudula Chandrupatla*

Department of Anatomy, Apollo Institute of Medical Sciences and Research.
*Corresponding Author

Dr. Dilip Mathai

DEAN, Apollo Institute of Medical Sciences and Research.

ABSTRACT

Learning environment of an institution is the environment experienced or perceived by both students and teachers. Learning environment is broader than just the material infrastructure like class rooms, lecture theatres, labs but also include other features like characteristics of the learners, goals for teaching and learning, activities that will best support learning, assessment strategies that will best measure and drive learning, and the culture that pervades the learning environment. The educational environment plays a very important role in effective student learning. It has a significant impact on their behavior, academic progress and sense of well being. The environment can cause change in behavior of students in all the three domains such as cognitive, affective and psychomotor. As learning requires both a facilitating environment and a perceptive student, assessing perception of students would inform and strengthen efforts to optimize learning outcomes. Apollo Institute of Medical Sciences and Research, though a nascent institution, has implemented a rigorous academic programme including early clinical exposure, self directed learning, small group teaching, horizontal alignment & integration and vertical integration from first MBBS since the inception which was in 2012. We wished to study the impact of these approaches, which were new in this country at that time, on the perception of students. Retrospectively and with the benefit of hindsight, introduction of competency based medical education in 2019, which has all the above mentioned teaching methods at the core, has made our study more relevant in way that was not foreseen at the initiation of study. Our study will be one of the first to reveal the impact of methods used in competency based medical education on the perception of student's vis-à-vis, learning environment. DREEM questionnaire is used to study the effectiveness of learning environment.

KEYWORDS : Educational environment, Students perception, DREEM questionnaire

INTRODUCTION:

"The environment should act as an aquarium which reflects the ideas, ethics, attitudes and culture of the people who live in it" – Loris Malaguzzi^[1].

According to Harden " measurement of educational environment act as a basis for the diagnosis of practices within an institution , and as the environment is changeable, the measurement may act as a platform for making necessary modifications for better educational practices in line with institutions own goals"^[2].

A medical student teaching is teaching an adult learner. 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. The educational environment makes an impact on students' learning experiences and outcomes. Educational environment influences how, why and what students learn which is crucial to the success of the curriculum. The curriculum and students' perception towards it may affect the quality of learning. The student's feedback in such system is pivotal for the success of the educational climate.

Teaching and learning in clinical setting is a matter of interest in medical schools and clinical attachments have strong influence in shaping the new doctors' competencies. Studies have shown that although teachers and students are educational partners they have different ideas about the clinical setting in terms of quality. Qualitative studies have shown discrepancies between perceptions of students, especially when they attach to clinical wards and hospital environment. It seems unhelpful for their learning, mostly because of the teachers' behavior. Institutions in higher education are concerned with their quality which is perceived as the quality of learning environment.

A positive learning environment during undergraduate education leads to increased satisfaction, achievement and success as practitioner in future. Positive institutional profile, improved students performance, higher staff morale, increased

motivation among students and quality teaching are some of the indicators for healthy educational environment. Research in the learning environment can guide the medical teachers to introspect, device and incorporate the best learning strategies for the improvement of the educational environment.

A number of instruments have been used in the literature to measure educational environments in medical and allied healthcare education, both at undergraduate and postgraduate levels. However, the Dundee Ready Educational Environment Measure (DREEM) continues to be the most widely used instrument. The DREEM questionnaire was originally developed at Dundee and released as AMEE Medical Education Guide No. 23 by Genn in 2001 and has been accepted as an international instrument for assessing the educational environment^[3]. It has been widely used as an instrument to collect information about the educational environment in many undergraduate health professional institutions across countries, cultures and nationalities^[4].

METHODOLOGY

The study is been conducted in Apollo Institute of Medical Sciences and Research, Hyderabad after the ethical approval. The study participants included are the students of all batches of medical college. Informed consent form was prepared according to the requirement of the Ethics committee and consent was taken from students . **DREEM questionnaire (Annexure 1)** is a pre-validated questionnaire, developed in Dundee university^[5,6] and it was used after approval from Ms.SueRoff (Staff of Dundee,UK on July 2,2019), to evaluate the students perception of educational environment.

It includes 50 questions spanning five domains Viz., Students perception of learning (**SPL**), Students' Perception of Teachers (**SPT**), Students' Academic Self-Perception (**SASP**), Students' Perception of Atmosphere (**SPA**) and Students' social self perception (**SSSP**). The minimum total score is 50 and maximum is 250. Responses to the questions are rated in likert scale with a minimum score of 1 and maximum of 5.

Table No 1: Distribution Of Number Of Questions And Scores In Each Domain Of DREEM

S.No	Domain	No.of Questions	Minimum score	Maximum score
1	SPL	12	12	60
2	SPT	11	11	55
3	SASP	8	8	40
4	SPA	12	12	60
5	SSSP	7	7	35
		50	50	250

The data was collected and entered periodically in Excel sheet. Statistical analysis was done from the collected data using SPSS version 25.

1. Descriptive Statistics:

As all variables were ordinal variables, Median and Interquartile range(IQR)were used to summarize the data.

2. Inferential Statistics:

- Kruskal-Wallis test was done to assess the statistical significance of differences between the median score of five batches for both total DREEM scores and domain specific scores. Alpha value for the test was set at 0.05 and any p-value less than 0.05 was considered as statistically significant.
- Pair wisecomparisons were done using Mann-Whitney U test between every pair of two batches from the total set consisting of 2019,2018, 2017, 2016, 2015 batches. As there were 10 possible combinations and the same number of hypothesis to be tested, Bonferroni correction was applied to decide the optimal cutoff value for statistical significance (0.05/10=0.005) to account for multiple comparison issues. The final p-value cutoff chosen for pair wise comparison was 0.005.

RESULTS:

Overall Analysis Of Total DREEM Scores:

Table 2: Median And Interquartile Range (IQR) Of Total DREEM Scores For Each Batch

S.No	Batch	No. of participants	Median (IQR)
1	2019	89	173 (23.5)
2	2018	55	163 (29)
3	2017	97	165 (28)
4	2016	61	180 (28.5)
5	2015	69	171 (28)
	Total	371	171 (29)

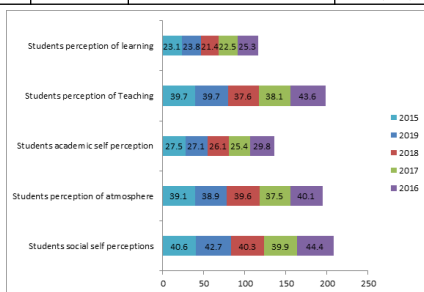


Figure 1 :Average DREEM Score Among Different Batches

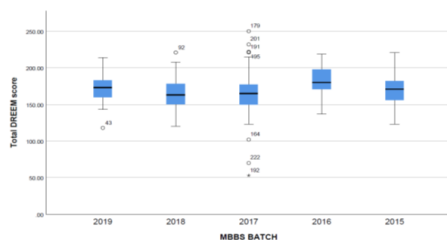


Figure 2: Box Plots Of Total DREEM Scores

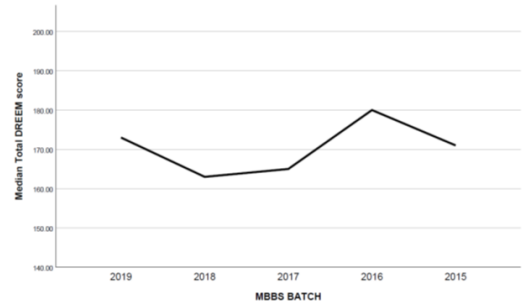


Figure 3: Line Plot Of Median Total DREEM Scores For All The Batches

Table 3 : Kruskal- Wallis Test For Overall Difference In Median Total DREEM Scores Between Batches- Summary Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Total is the same across categories of MBBS_BATCH.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Table 4: P-values For Pair Wise Comparison Of Differences In Total DREEM Scores Between Batches

S.No	Batches compared	p-value
1	2019 Vs 2018	0.04
2	2019 Vs 2017	0.007
3	2019 Vs 2016	0.001***
4	2019 Vs 2015	0.509
5	2018 Vs 2017	0.781
6	2018 Vs 2016	<0.001***
7	2018 Vs 2015	0.211
8	2017 Vs 2016	<0.001***
9	2017 Vs 2015	0.074
10	2016 Vs 2015	0.001***

***p-value <0.005 (Cutoff value for pair wise comparison is 0.005)

Summary Of Overall Analysis Of Total DREEM Scores:

- The median of Total DREEM scores for students in Apollo medical college is 171.
- There is statistically significant difference in median of total DREEM scores between various batches (p-value <0.001) as revealed by Kruskal- Wallis test shown in table 3.
- The trend in Median of total DREEM scores is depicted in Figure 2. The score has declined from 2019 (First MBBS) to 2018 batch (Second MBBS/3rd Semester) before rising to maximum value in 2016 batch. Minimum score is seen in 2018 batch. After a rise to maximum, score tends to fall from 2016 to 2015 batch.
- Pair wise comparison with p-value cutoff of 0.005 revealed statistically significant difference in 2019 Vs 2016 (p=0.001), 2018 Vs 2016 (p<0.001), 2017 Vs 2016 (p<0.001) and 2016 Vs 2015 (p=0.001). Thus, there is statistically significant difference between 2016 batch and every other batch as shown in table 4.

SUMMARY OF RESULTS:

A total of 371 students participated in the study of whom 23.9% were 2019 batch,14.8% were 2018 batch,26.1 % were 2017 batch,16.4% were 2016 batch and 18.5% were 2015 batch. The median total DREEM score of Apollo Institute of Medical Sciences and Research , Hyderabad, was 171 .Overall analysis for total DREEM scores revealed Significant differences in median scores between the batches. Students from 2016 batch showed highest total scores and 2018 batch the least total scores. Domain specific analysis revealed Students from 2016 batch showed highest scores in all the domains. There trend for fall in fall in DREEM scores after First

MBBS in the all the domains. The scores from 2015 batch are lesser than those of 2016 batch. Lower than expected scores in all domains for 2015 batch may be because of the stress of exit exam for MBBS and entrance exam for the post graduation course.

DISCUSSION:

Learning environment refers to an educational approach, cultural context or physical setting in which teaching and learning occurs. In 1998, the World Federation for Medical education highlighted the learning environment as one of the determining factors in the evaluation of medical education programs^[7]. The Dundee Ready Educational Environment Measure (DREEM) instrument has been developed and validated to find out how students perceive the ideal educational environment. The DREEM is a 50 item measure of students perceptions of their learning environment, with five scales recording the perception of learning, perception of teachers, academic self perception, perception of atmosphere and social self perception. It has been used for many purposes like identifying the strengths and weakness of a teaching program, comparing the outcomes of a program, assessing the academic achievement of medical students and evaluating changes after improving the medical educational curriculum^[5].

The median total DREEM at Apollo medical college, Hyderabad was 171 which means the teaching environment in our Institute was excellent. Scores in the range of 101 – 150 are viewed as more positive than negative and 151 – 200 as excellent. However scores in the range of 51 – 100 indicate plenty of problems, while 0-50 indicates very poor score^[6]. The global mean score of the study sample (170) was more than what was observed in studies from University of Dundee (139) and BP Koirala Institute of Health Sciences in Dharan Nepal (130) and from Faculty of Medical Sciences, University of Sri Jayawardenapura in Sri Lanka (107)^[8]. Previous studies pointed out that students of innovative curricula have a tendency to show more satisfaction with their educational environments compared to students of traditional curricula, and higher DREEM scores tend to indicate more student-centered curricula^[5]. The highest score could be achieved because of introduction in our college curriculum programs like Problem based learning (PBL) and structured bedside clinical teaching with specific objectives, mentoring students by faculty frequently and parent teacher meetings in every semester. Colleges and universities with small groups of students foster greater interaction with the teaching staff, and the development of more student societies; both factors being associated with the achievement of greater academic success.

There is an initial decline in both overall scores and domain specific scores from 2019 batch (First MBBS) to 2018/2017 batch (second MBBS). This initial decline was followed by a rise to a maximum in 2016 batch (Final MBBS, Part-I) for all the scores. After the peak in 2016 batch, scores fell subsequently in 2015 batch (Final MBBS, Part-II). This trend has not been previously described in any of the reviewed studies conducted in India^[5,10] and other countries^[11,12], although it is consistent with the experience in this college and other colleges where the investigators had worked. The declines in scores from 2019 to 2018/2017 batch probably are due to change in attitudes of students as they perceive themselves to be released from a grueling First MBBS schedule in our college. This is corroborated by lowest rate of responders (52%), who participated in the study, in 2018 batch. All the non-responders were absent in the class. As the students perceive clinical postings to be unrelated to second MBBS exams, many of them abstain from clinical postings. Maximum scores seen in 2016 batch probably reflect increased clinical exposure by this time, increased awareness of challenges which have to face like PG entrance exams, USMLE etc., also this usually is the time when students begin to discover their field of interest

for subsequent career. The decrease in scores from 2016 to 2015 batch may be due to stress of final MBBS exams, impending NEET PG exams and challenge of transition from life in medical college, where they are mentored, to society, which expects them to be independent practitioners of evidence-based medicine.

CONCLUSIONS:

Learning environment of an Institution plays a very important role in effective student learning. The Median total DREEM score was highest in 2016 batch (180) and lowest was in 2018 batch (163). Highest scores for the batch 2016 may be due to interaction with the patients and relatives during the clinical postings among others. The least score for the batch 2018 might be due to the long duration of the second phase of MBBS and casual attitudes of students towards learning after the stressful first year course. The initial decline in scores could be tackled by measures like increasing involvement of students' during curriculum development so that it is responsive to the needs of students, counseling in stress relieving measures as part of curriculum, encouragement of extracurricular activities, elective postings in the hospitals & research labs early in second MBBS, early involvement of students in health camps etc., might be helpful to improve the students' perception of the learning environment.

Acknowledgments:

1. The guidance and assistance provided by the CMCL FAIMER Team at Ludhiana and online by the CMCL FAIMER Team and all the 2018 and 2019 Fellows during the Progress Report, Project Report, Final Report and all the modules.
2. The support given by the Dean, Faculty of Anatomy and HOD's of all disciplines.
3. Approval for use of DREEM questionnaire by Ms.SueRoff (Staff of Dundee, UK)
4. Our Year 1 to Year 5 medical students for their enthusiastic participation.
5. Statistician for the data analysis

Annexures :

ANNEXURE I

Perception Of Students (DREEM Questionnaire):

- Dear students, we are taking a survey on educational environment of our college, to improve the teaching and learning atmosphere and we need your unbiased opinion.
- Kindly fill in the questionnaire as appropriate to your situation by marking the rating scale against each question.
- You need not reveal your identity. Information collected will be kept confidential.
- Thank you very much for your precious responses
- Likert Scale : 1 2 3 4 5
(1 –Strongly disagree ; 2- Disagree; 3- Unsure; 4- Agree; 5 - Strongly agree)

Students' Perception Of Learning (SPL)

No	Item	1	2	3	4	5
1	I am encouraged to participate in class					
2	The teaching is often stimulating					
3	The teaching is student-centred					
4	The teaching is sufficiently concerned to develop my competence					
5	The teaching is well-focused					
6	The teaching is sufficiently concerned to develop my confidence					
7	The teaching time is put to good use					
8	The teaching over-emphasized factual learning					

9	I'm clear about the learning objectives of the course					
10	The teaching encourages me to be an active learner					
11	Long-term learning is emphasized over short-term learning					
12	The teaching is too teacher-centred					
Any other comments-						

Students' Perception of Teachers (SPT)

No	Item	1	2	3	4	5
1	The teachers are knowledgeable					
2	The teachers are patient with patients					
3	The teachers ridicule the students					
4	The teachers are authoritarian					
5	The teachers have good communication skills with patients					
6	The teachers are good at providing feedback to students					
7	The teachers provide constructive criticism here					
8	The teachers give clear examples					
9	The teachers get angry in class					
10	The teachers are well-prepared for their classes					
11	The students irritate the teachers					
Any other comments-						

Students' Academic Self-Perception (SASP)

No	Item	1	2	3	4	5
1	Learning strategies that worked for me before continue to work for me now					
2	I am confident about passing this year					
3	I feel I am being well prepared for my profession					
4	Last year's work has been a good preparation for this year's work					
5	I am able to memorize all I need					
6	I have learned a lot about empathy in my profession					
7	My problem-solving skills are being well developed here					
8	Much of what I have to learn seems relevant to a career in healthcare					
Any other comments-						

Students' Perception of Atmosphere (SPA)

No	Item	1	2	3	4	5
1	The atmosphere is relaxed during ward teaching					
2	This school is well time-tabled					
3	Cheating is a problem in this school					
4	The atmosphere is relaxed during lectures					
5	There are opportunities for me to develop my interpersonal skills					
6	I feel comfortable in class socially					
7	The atmosphere is relaxed during class/seminars/tutorials					
8	I find the experience disappointing					
9	I am able to concentrate well					
10	The enjoyment outweighs the stress of studying medicine					
11	The atmosphere motivates me as a learner					
12	I feel able to ask the questions I want					

Any other comments-						
Students' social self perceptions (SSSP)						
No	Item	1	2	3	4	5
1	There is a good support system for students who get stressed					
2	I am too tired to enjoy the course					
3	I am rarely bored in this course					
4	I have good friends in the school					
5	My social life is good					
6	I seldom feel lonely					
7	My accommodation is pleasant					
Any other comments-						

REFERENCES

- Malaguzzi L. the role of the environment - the Third teacher.
- Harden RM, Education CM. Ten questions to ask when planning a course or curriculum. 1986;
- Genn JM. AMEE Medical Education Guide No . 23 (Part 1): Curriculum , environment , climate , quality and change in medical education- a unifying perspective. Med Teach. 2001;23(4):337-44.
- Barssaw B, Roff SUE, Aleer SMC, Roopnarinesingh S, Lisle JDE, Teelucksingh S, et al. Students ' perspectives on the educational environment , Faculty of Medical Sciences , Trinidad. Med Teach. 2003;25(5):522-6.
- Roff S. The Dundee Ready Educational Environment Measure (DREEM) - A generic instrument for measuring students' perceptions of undergraduate health professions curricula. Med Teach. 2005;27(4):322-5.
- McAleer S, Roff S. AMEE Medical Education guide No.23 (part 3): A practical guide to using the Dundee Ready ENvironment measure (DREEM). Med Teach. 23.
- Hammond SM, O'Rourke M, Kelly M, Bennett D, O'Flynn S. A psychometric appraisal of the DREEM. BMC Med Educ. 2012;12(1).
- Jiffry MTM, McAleer S, Fernando S, Marasinghe RB. Using the DREEM questionnaire to gather baseline information on an evolving medical school in Sri Lanka. Med Teach. 2005;27(4):348-52.
- Varma R, Tiyyagi E, Gupta JK. Determining the quality of educational climate across multiple undergraduate teaching sites using the DREEM inventory. BMC Med Educ. 2005;5:1-4.
- Abraham R, Ramnarayan K, Vinod P, Torke S. Students' perceptions of learning environment in an Indian medical school. BMC Med Educ. 2008;8(Mmmc):1-5.
- Edgren G, Haffling AC, Jakobsson U, McAleer S, Danielsen N. Comparing the educational environment (as measured by DREEM) at two different stages of curriculum reform. Med Teach. 2010;32(6).
- Whittle S, Whelan B, Murdoch-Eaton DG. DREEM and beyond; studies of the educational environment as a means for its enhancement. Educ Heal Chang Learn Pract. 2007;20(1).