

## The Effect of Family Medicine Programs' Educational Environment on Post graduate Medical Students' Learning Perceptions, in Egypt

Maha Mowafy\*, Mouchira Zayed \*\*, Nagwa Eid\*

\*Family Medicine Department, Cairo University, \*\*Community Medicine Department, Cairo University

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### Abstract

**BACKGROUND:** The quality of the Educational environment is a key determinant of a student centered curriculum. One of most widely used contemporary tools for evaluation of the learning environment is the Dundee Ready Education Environment Measure (DREEM).

**The OBJECTIVE** is to compare the quality of the educational environment as perceived by postgraduate medical students training in three different settings so that corrective measures could be taken to enhance students learning experiences. **METHODS:** This study used qualitative analysis with DREEM questionnaire, to evaluate the educational environment during post graduate medical students' training in the three different settings. The questionnaire was administered to 135 postgraduate medical students from three different Family Medicine programs in Cairo. Fifty six (56) were registered for Egyptian Board Membership, 61 for Professional Diploma, and remaining 18 students were registered for academic degree in Family Medicine department at Cairo University. Those are all postgraduate students registered for the academic year 2013/2014.

**RESULTS:** The overall total DREEM mean score for the three groups was 120.5/200 (60.3%). The highest DREEM mean score was found to be 124.8/200 (62.4%) for the Egyptian Board Membership group followed by 119.1/200 (59.6%) for Diploma group, then 114.1/200 (57.1%) for Academic degree postgraduate students. When comparing the five subscales of the three groups; greatest variation between groups was noticed in the Students' Perception of learning and Atmosphere subscales, (P value= .002 and <0.001 respectively).

**CONCLUSIONS:** There is undeniable need for improvement of educational environment in particular areas of some of family medicine postgraduate courses.

**Key words:** DREEM, Educational Environment, Medical Students, Evaluation.

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### Introduction

Nowadays educational environment has become one of the most important determinants of curriculum success and the quality of the learning environment has a marked effect on learning<sup>(1)</sup>.

Among medical educators it is well agreed that the educational environment, both academic and

clinical, is an important determinant of medical students' attitude, knowledge, skills, progression and behaviors<sup>(2)</sup>. The students' feedback is pivotal for a successful educational climate and can be a good basis for reform and improvement<sup>(3)</sup>. Accordingly evaluation of the educational environment is an important

component of programme appraisal in order to achieve a high quality, student centered curriculum. In order to conduct such an evaluation the use of a comprehensive, reliable and valid instrument is crucial <sup>(4)</sup>.

The Dundee Ready Education Environment Measure (DREEM) is one of the most widely used contemporary tools for evaluation of the learning environment <sup>(4)</sup>. This tool has been used to detect weaknesses in curricula and assess the impact of new curricular interventions <sup>(5,6)</sup>. It is also used as a tool for international comparison between medical schools<sup>3</sup>. The DREEM questionnaire is more specific on medical and healthcare-related programs and is applied to a large scale of undergraduate medical education centers worldwide<sup>7</sup>.

As Family Medicine is one of the postgraduate education in Egypt, it was mandatory to evaluate the educational environment of the different available training courses. The goal of this study is to provide a feedback about educational environment related to those courses, so that early corrective measures could be taken.

Objective of the study: To compare the quality of the educational environment as perceived by postgraduate medical students in three different settings so that corrective measures could be taken to enhance students learning experiences.

## **Methods**

This study used qualitative analysis with the Dundee Ready Education

Environment Measure (DREEM) questionnaire, to evaluate the educational environment during post graduate medical students' training in the three different program settings.

DREEM was originally developed at Dundee as AMEE Medical Education Guide No.2 3 by Genn in 2001 <sup>(2)</sup>. It has been validated as a universal diagnostic inventory for assessing the quality of educational environment in many institutions <sup>(2,8,9)</sup>.

DREEM is a 50 items inventory each of the 50 items is scored on a 5-point scale, where 4 = Strongly Agree, 3 = Agree, 2 = Unsure, 1 = Disagree and 0 = Strongly Disagree. Reverse scoring is required for items 4, 8, 9, 17, 25, 35, 39, 48 and 50. Thus, higher scores indicate a more positive evaluation. Depending on DREEM questionnaire students' perception on educational environment items was subdivided into 5 subscales. These subscales give opportunity to researcher to specify weaknesses or strengths of program/course. 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 faculty. Items with a mean score between 2 and 3 reflect areas that are neither strong nor weak but identify areas that could be enhanced <sup>(10)</sup>.

The five separate elements of the DREEM questionnaire and their maximum scores are:

- Students' Perceptions of Learning: 12 items (items 1, 7, 13, 16, 20, 22, 24, 25, 38, 44, 47 and 48) (maximum score 48).
- Students' Perceptions of Teachers: 11 items (items 2, 6, 8, 9, 18, 29, 32, 37, 39, 40 and 50) (maximum score 44).
- Students' Perceptions of their Academic Skills: 8 items (items 5, 10, 21, 26, 27, 31, 41 and 45) (maximum score 32).
- Students' Perceptions of the Learning Atmosphere: 12 items (items 11, 12, 17, 23, 30, 33, 34, 35, 36, 42, 43 and 49) (maximum score 48).
- Students' Perceptions of the Social Environment: 7 items (items 3, 4, 14, 15, 19, 28 and 46) (maximum score 28).

#### Participants:

In the present study, DREEM was distributed and self-administered by all registered postgraduate medical students of Family Medicine in three different settings (n = 135); during the academic year 2013/2014 and who started their clinical training. They consisted of: first group of postgraduate professional diploma in family medicine candidates (n=56), they receive training for one year. For the second group consisted of candidates registered for Egyptian Family Medicine membership (n=61); candidates in this group receive training for 4 years. While, the last group was students of the academic

degrees (Master and Medical Doctorate) registered in the family medicine department at faculty of medicine Cairo University.

All questionnaires were available in paper format; distributed and returned the same day of the scientific activities in case of group two and three (membership and academic degree), or during a training day in case of the diploma group. This allowed us to achieve a 100% response rate. Students were told to only comment on their recent experience of the academic year 2013/2014. Statistical analysis was performed using Microsoft Excel and SPSS Statistical software version 17.0. Kruskal wallis, Pearson Chi square and One-way analysis of variance (ANOVA) with Post Hoc tests for comparisons between students' responses were used according to different study questions.

For ethical consideration students were made aware of the aim of the study and the importance of high levels of participation. Additionally the approval of the research committee of Family Medicine Department, Scientific Committee of Egyptian and Professional Diploma training were obtained.

#### Results

A total of 135 post graduate students completed the questionnaire (Professional Diploma group=56, Membership group=61, Academic degree=18). Among respondents, there were 81 (61.4%) females and 51 (38.6%) males' participants. The same pattern was followed for both

membership and academic group where females representing 36 (62.1%) and 17 (94.4%) of each group respectively. On the other hand; there was equal number of females and males participants in the diploma group 28 (50.0%).

Table 1 shows the DREEM subscale mean scores for Professional Diploma Students, Egyptian board membership students and Academic degree students. Overall total DREEM mean score for the three groups was 120.5/200 (60.3%). The highest DREEM mean score was found to be 124.8/200 (62.4%) for membership group followed by 119.1/200 (59.6%) for Diploma group, then 114.1/200 (57.1%) for Academic degree postgraduate students.

Also, the DREEM mean scores for each group, with comparison of all contributory subscales are depicted in Table 1. When comparing the five subscales of the three groups using Kruskal- Wallis and the chi-square tests; a great variation between groups was noticed in the Students' Perception of learning and Atmosphere subscales. One-Way analysis of variance (ANOVA) yielded  $F$  (variance ratio)=6.72,  $P = 0.002$ , and  $F=8.885, P=.000$  which indicated high statistically significant differences between the same two DREEM domains. Further analysis with Post Hoc tests showed no statistically significant difference between each DREEM domain within the same group.

As regard the perception of learning subscale; the highest mean score was

29.2±9.1 SD (60.7%) for the membership group, followed by the academic degree 27.9±9.6 SD (58.2%) indicating that students in both groups had a more positive perception of learning. Finally the diploma group 23.4±6.5 SD (48.8%) where learning was negatively perceived. It is noteworthy the minimum score for each of the three groups was the same (12.0) indicating very poor perception of teaching.

The three studied groups perceived the atmosphere as a more positive attitude indicated by their mean score for this subscale 27.6±6.0 SD (57.5%), 33.0±7.5 SD (68.7%) and 27.0±8.3 SD (56.3%) in diploma, membership and academic degree groups respectively. Again the minimum score for each of the studied groups was the same (12.0) indicating an unfavorable environment.

The course organizers were perceived as going in the right direction by the students in the three studied groups with mean scores of 29.2±5.3 SD (66.3%), 29.0±5.4 SD (65.8%) and 27.1±11.5 SD (61.6%) in diploma, membership and academic degree groups respectively.

Post graduate students from the three groups had an academic self-perception more on the positive side with mean scores of 19.5±4.4 SD (60.8%), 20.9±7.1 SD (65.2%) and 16.8±6.9 SD (52.5%) in diploma, membership and academic degree groups respectively. Moreover the three groups had a social self-perception not too bad with mean scores 16.8±3.9 SD (60.0%), 18.6±4.5 SD (66.5%) and 15.9±5.3 SD (56.6%)

in diploma, membership and academic degree groups respectively based on the DREEM's guide for interpreting the subscales.

Responses to all items are shown in Table 2 and highlighted items showed responses that are significantly different across the three groups. In total groups there were 8 negative statements (1, 2, 15, 31, 33, 37, 40 & 50) and 5 items detected strength points in the educational climate (8, 17, 35, 39 & 49). It is noticed that the three groups scored above 3.5 for the negative item 17; denoting that cheating was not a problem in any of the courses. Only one item was scored negatively by the three groups which is number 1 "I am encouraged to participate during teaching sessions".

Diploma postgraduate students scored less than 2 for 21 items (1, 2, 6, 7, 11, 12, 13, 15, 16, 20, 21, 30, 31, 33, 34, 37, 40, 43, 44, 47 & 50) and above 3.5 for 5 items (4, 9, 17, 35, and 39) which are considered as real positive points. Membership students scored less than 2 for only one item (1) and above 3.5 for 3 items (8, 17 and 35). Finally for the academic group scored less than 2 for 15 items (1, 2, 11, 15, 19, 20, 23, 30, 31, 33, 41, 45, 46, 48 and 50) and above 3.5 for 3 items (8, 17 and 35).

The worst score of diploma Group was 1.55 for "The program organizers are knowledgeable". The worst score of membership Group was 1.77 for "I am encouraged to participate during teaching sessions"; while for the academic group it was 1.38 "I have learnt a lot about empathy in my profession". On the other hand the

negative item 8 was the highest to be scored by diploma group and 17 by both membership and academic groups.

## Discussion

Every university or learning institution must be targeted to offer the best possible environment and learning experience in order to encourage students to perform to their maximum potentials. Accordingly students themselves should play an active role in the evaluation, development and enhancement of the quality of their learning experience thus taking a positive role rather than merely being passive receivers of learning<sup>(11)</sup>.

In the present study, the educational environment was rated more positive than negative (Mean DREEM score for the 3 study groups was 120.6/200) or expressed as percentage 60.3% thus reflecting a somewhat positive perception of medical students for the educational environment. Similar results were achieved in India 123/200<sup>(11)</sup> and Gulf Medical School 120/200<sup>(12)</sup>. On the other hand lower scores were reported in Srilanka (108/200, Trinidad 109/200)<sup>(9)</sup> and higher scores for medical schools in Nepal 130/300 and UK 139/200<sup>11</sup>.

The educational environment showed variation among the three groups where the highest DREEM mean score was for membership group 130.7/200 (65%) followed by diploma group 116/200 (58.3%) and the least for the Academic group 114.7/200 (57.4%). The apparent differences in how the three different groups experienced the

learning environment highlighted the difference in their degree of experience in both the educational institution and the curriculum. Since students' perception of the educational environment may be influenced by increasing the variety of the student population, determining the students' expectations in order to improve the course in any university is inevitable<sup>(13)</sup>.

In order to detect the weaknesses and strengths more clearly, the five essential domains were compared using the guide of Roff to interpret the mean scores<sup>(10)</sup>. All students had a more positive perception of learning (average mean score 26.5), their perception of course organizers moved in the right direction (average mean score 28.8), their academic self-perception was on the positive side (average mean score 19.6), they had a more positive perception of atmosphere (average mean score 30.0) finally their social self-perception was not too bad (average mean score 17.5)

On comparing the five subscales of the three groups, greatest variation was noticed in the students' perception of learning (55%) and atmosphere (62%) subscales with a statistically significant difference with P-value equal 0.002 and 0.000 respectively. As learning is a complex process and is greatly affected by the educational environment thus students' expectations for learning perception should be emphasized by using modern methods of teaching and use of new and up to date scientific resources. Also, it's important for students that their teachers should be

competent thus, while planning methods for teaching, the students' expectation should be considered<sup>14</sup>. Regarding the ideal educational atmosphere from students' viewpoints it's the one which provides appropriate learning conditions, less stress learning environment and has an efficient system for monitoring the performance. As the educational atmosphere is a motivating factor for students' learning it should be considered as an important factor for improvement of the educational environment<sup>(15)</sup>.

On comparing the five subscales among the three groups the results showed the following: Concerning the perception of learning, it was noted that (group 2 membership) had the highest mean score (29.2) followed by (group 3 Academic degree 27.9) indicating a more positive perception of educational environment than (group 1 Diploma 23.4). Concerning the course organizers' domain it was perceived as going in the right direction for students of the three groups. As the main task of the university is to train, teachers are one of the key components of the training process<sup>16</sup>. Teachers have great influence on the learning process as regards guiding and training students, improving interpersonal communication and crisis management<sup>(17)</sup>. As medical education is rigidly changing, faculties need to be up to date, have enough skills, use time efficiently, use modern active teaching methods such as problem solving, small group teaching and computer based methods<sup>(18)</sup>.

Academic self- perception of the three groups showed a more positive score. This is mainly concerned with the view of students about their academic abilities and skills as well as their expected duties as one of the most important factors which effects academic success of the students is their learning skills <sup>(19)</sup>. Students' academic achievement requires the use of reliable scientific resources and appropriate learning methods. Accordingly familiarizing the students with the scientific databases, creating a sense of cooperation among students and efficient use of educational facilities should be primarily considered <sup>(13)</sup>.

Social self -perception for the three groups was average (not too bad). This subscale reflects one of the students' expectations regarding the educational environment which is a creative and less stress environment. There is an indirect relationship between stress and academic performance of students. Students reporting higher stress levels perceive lack of self –confidence <sup>(20)</sup>.

Taking into consideration individual items to detect strengths and weaknesses in educational environment (Table 2), it was noted that group 2 membership scores showed better perception for educational environment in comparison to the other two groups with only one item below 2 and 3 items above 3. The students felt that they are not encouraged to participate during teaching sessions. Also students felt that teachers do not ridicule them, cheating is not a problem and they find

the course not disappointing while the remaining items may need enhancement.

Concerning the eight negative statements by the three groups, the students' perception of teaching or course organizers was the most defective domain where all of them agreed that the program organizers are not knowledgeable; do not give clear examples, not well prepared for teaching sessions. As regards social perception they mentioned not having good friends, while concerning the atmosphere they do not feel socially comfortable in class. Finally, students did not have empathy concerning the educational environment and were not encouraged to participate during teaching. These results emphasize the role of the staff who should be responsible for doing their tasks efficiently, be experienced and knowledgeable, have good communication skills, to be patient and tolerant with their students. Also the presence of positive and friendly relationship among students is essential as a coping mechanism to minimize the effects of stress generated by the study load.

The statement which all groups agreed upon was that they are not encouraged to participate during teaching sessions thus reflecting a passive teacher centered way of learning. It appears that students perceive teachers as the dominant partners in the learning transaction. In this situation, students learning behaviors may deviate from being student centered to spoon feeding teacher-centered conduct <sup>(13)</sup>.

The worst score of diploma group was 1.55 for "the program organizers are knowledgeable". This reflects that students had high levels of expectations of the educational environment particularly for teachers. Therefore it is important that teachers be competent and well prepared for teaching and on planning methods of teaching, the previous expectations should be considered <sup>(14)</sup>.

As for the worst score of academic group it was 1.38 "I have learnt a lot about empathy in my profession". This shows a negative attitude of students towards educational environment thus requiring encouragement of interaction with patients and developing more interactive doctor patient relationship.

## Conclusion

The results of this study showed that the educational environment is multidimensional and hence educational planners should consider this while implementing corrective strategies. Overall the educational environment was rated more positive than negative. The membership group gave the highest score. The main two domains that showed statistical significant difference among the three groups were the atmosphere and the learning perception revealing defective aspects. Concerning the individual items, the perception of teaching was the most defective domain among all groups.

These results should be used by curriculum planners to upgrade the students' educational environment to higher levels. Accordingly, designing

and implementing interventions to remedy defective domains of the educational environment for more effective learning is crucial, where strengths should be further reinforced and weaknesses should be improved.

This study has established a baseline, subsequent studies are recommended for analysis of the underlying factors of defects in order to plan reformation strategies.

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**Table 1: DREEM mean subscale and percentage scores for all groups:**

	Group 1 Diploma (n=56)		Group 2 Egyptian Board Membership (n=61)		Group 3 Academic Degree (n=18)		Total of all groups (n=135)		P value
	Mean ±SD (min-max)	DREEM % for each Group	Mean ±SD (min-max)	DREEM % for each Group	Mean ±SD (min-max)	DREEM % for each Group	Mean ±SD (min-max)	DREEM % for each Group	
Perception of Learning (max score 48)	23.4±6.5 12.0-45.0	48.8%	29.2±9.1 12.0-72.0	60.7%	27.9±9.6 12.0-43.0	58.2%	26.5±8.5 12.0-72.0	55.2%	.000*
Perception of course Organizers (max score 44)	29.2±5.3 11.0-39.0	66.3%	29.0±5.4 11.0-40.0	65.8%	27.1±11.5 11.0-54.0	61.6%	28.8±6.6 11.0-54.0	65.4%	0.259
Academic self- perception (max score 32)	19.5±4.4 12.0-29.0	60.8%	20.9±7.1 8.0-37.0	65.2%	16.8±6.9 8.0- 31.0	52.5%	19.6±6.2 8.0-37.0	61.1%	0.135
Perception of Atmosphere (max score 48)	27.6±6.0 12.0-46.0	57.5%	33.0±7.5 12.0-51.0	68.7%	27.0±8.3 12.0-38.0	56.3%	30.0±7.5 12.0-51.0	62.5%	.000*
Social Self- Perceptions (max score 28)	16.8±3.9 7.0-25.0	60.0%	18.6±4.5 7.0-34.0	66.5%	15.9±5.3 7.0-24	56.6%	17.5±4.5 7.0-34.0	62.5%	0.066
Overall DREEM (max score 200)	116.5	58.3%	130.7	65.4%	114.7	57.4%	120.6	60.3%	0.09

\*p value is significant &lt;0.05

**Table 2: Mean DREEM scores per item and Medical Groups:**

P value	All groups	Group3	Group2	Group1	QUESTIONS
.511	1.73	1.89	1.77	1.62	1. I am encouraged to participate during teaching sessions
.000*	1.91	1.76	2.28	1.55	2. The program organizers are knowledgeable
.114	2.92	3.12	3.10	2.65	3. There is a good support system for students who get stressed
.065	3.33	2.69	3.34	3.50	4. I am too tired to enjoy the course
.018	2.79	2.69	3.07	2.53	5. Learning strategies which worked for me before continue to work for me now
.192	2.07	2.18	2.18	1.92	6. The course organizers espouse a patient centered approach to consulting
.005	2.04	2.17	2.26	1.75	7. The teaching is often stimulating
.000*	3.74	2.56	3.64	4.18	8. The teachers ridicule the registrars
.004*	3.33	2.50	3.21	3.71	9. The teachers are authoritarian
.032	2.34	2.31	2.59	2.07	10. I am confident about my passing this year
.000	2.10	1.62	2.61	1.70	11. The atmosphere is relaxed during consultation/clinic teaching
.000	2.50	2.75	2.97	1.95	12. This program is well timetabled
.081	2.11	2.50	2.19	1.89	13. The teaching is student centered
.227	2.69	2.82	2.81	2.53	14. I am rarely bored on this program
.036	1.89	1.53	2.00	1.89	15. I have good friends on this program
.000	2.05	2.22	2.41	1.61	16. The teaching helps to develop my competence
.664	3.84	3.63	3.86	3.89	17. Cheating is a problem on this program
.321	2.17	2.06	2.24	2.14	18. The teachers have good communication skills with patients
.003		1.53	2.34	2.05	19. My social life is good
.000	2.10	1.94	2.44	1.77	20. The teaching is well focused
.018	2.09	2.31	2.25	1.86	21. I feel I am being well prepared for my profession
.027	2.44	2.31	2.73	2.18	22. The teaching helps to develop my confidence
.036	2.21	1.81	2.42	2.09	23. The atmosphere is relaxed during lectures
.013	2.45	2.88	2.62	2.14	24. The teaching time is put to good use
.088	2.32	2.50	2.48	2.09	25. The teaching over emphasizes factual learning
.047	2.61	2.13	2.70	2.64	26. Last year's work has been a good preparation for this year's work
.258	2.70	2.67	2.86	2.54	27. I am able to memorize all I need
.082		2.06	2.55	2.22	28. I seldom feel lonely
.255	2.29	2.81	2.27	2.14	29. The teachers are good at providing feedback to students
.003	2.00	1.67	2.26	1.82	30. There are opportunities for me to develop interpersonal skills
0.001	1.89	1.38	2.15	1.75	31. I have learnt a lot about empathy in my profession
0.029	2.28	2.75	2.42	2	32. The teachers provide constructive criticism here
0.001	1.98	1.69	2.29	1.75	33. I feel comfortable in class socially
0	2.03	2.06	2.46	1.57	34. The atmosphere is relaxed during seminars / tutorials
0.021	3.78	2.94	3.76	4.06	35. I find the experience disappointing

0.012	2.38	2.06	2.64	2.19	36. I am able to concentrate well
0.08	1.95	2.12	2.07	1.78	37. The teachers give clear examples
0.115	2.47	2.56	2.66	2.25	38. I am clear about the learning objectives of the program
0.009	3.52	3	3.33	3.89	39. The teachers get angry in teaching sessions
0.013	1.95	2	2.14	1.73	40. The teachers are well prepared for their teaching sessions
0.002	2.74	1.75	2.76	3	41. My problem solving skills are being well developed here
0.953	2.54	2.5	2.58	2.51	42. The enjoyment outweighs the stress of the program
0	2.36	2.44	2.76	1.91	43. The atmosphere motivates me as a learner
0.12	2.17	2.38	2.3	1.98	44. The teaching encourages me to be an active learner
0.058	2.01	1.62	2.17	2.03	45. Much of what I have to learn seems relevant to a career in healthcare
0.003	2.2	1.88	2.49	2	46. My accommodation is pleasant
0.006	2.27	2.62	2.47	1.95	47. Long term learning is emphasized over short term learning
0.004	2.63	1.87	2.92	2.52	48. The teaching is too teacher centered
0.026	3.66	3.19	3.48	3.98	49. I feel able to ask the questions I want
0.01	1.95	1.81	2.2	1.73	50. The students irritate the course organizers