

Big Sib Students' Perceptions of the Educational Environment at the School of Medical Sciences, Universiti Sains Malaysia, using Dundee Ready Educational Environment Measure (DREEM) Inventory

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Abstract

Background: A cross-sectional descriptive study was conducted among Big Sib students to explore their perceptions of the educational environment at the School of Medical Sciences, Universiti Sains Malaysia (USM) and its weak areas using the Dundee Ready Educational Environment Measure (DREEM) inventory. The DREEM inventory is a validated global instrument for measuring educational environments in undergraduate medical and health professional education.

Method: The English version of the DREEM inventory was administered to all Year 2 Big Sib students ($n = 67$) at a regular Big Sib session. The purpose of the study as well as confidentiality and ethical issues were explained to the students before the questionnaire was administered.

Results: The response rate was 62.7% (42 out of 67 students). The overall DREEM score was 117.9/200 (SD 14.6). The DREEM indicated that the Big Sib students' perception of educational environment of the medical school was more positive than negative. Nevertheless, the study also revealed some problem areas within the educational environment.

Conclusion: This pilot study revealed that Big Sib students perceived a positive learning environment at the School of Medical Sciences, USM. It also identified some low-scored areas that require further exploration to pinpoint the exact problems. The relatively small study population selected from a particular group of students was the major limitation of the study. This small sample size also means that the study findings cannot be generalised.

Keywords: curriculum, environment, perception, questionnaires, medical student, medical sciences

Introduction

Increasing attention is being paid to the contribution of the educational environment to learning. A conducive environment has a positive and significant impact on students' learning, academic progress, and well-being (1–4). Learning itself depends on many factors, but perhaps the most crucial factor is the engagement of the learner (5). The professional development of medical practitioners depends, to a large extent, on the attributes of the environment where they study or work (6). The educational environment includes social, cultural, and psychological elements, as well as the physical surroundings (7,8). The new-student orientation also influences students' perception of their learning environment. There is a positive association between good orientation

programmes and a positive attitude toward learning (9). A warm, supportive, and challenging educational environment is generally considered an essential pre-requisite for optimal learning (10). Studies of educational environments have been conducted by researchers in medicine, nursing, and other disciplines in various countries using the Dundee Ready Educational Environment Measure (DREEM) instrument. DREEM has been validated and exhibits consistently high reliability in variety of settings (4,11–14).

The participants in this pilot study were Big Sib students. The Big Sib programme is a part of the Personal & Professional Development Programme (PPDP) at the School of Medical Sciences (SMS), Universiti Sains Malaysia. A group of Year 2 medical students are selected as Big Sibs based on their academic achievement,

attitude, and behaviour in Year 1. The programme allows the Year 2 Big Sib students to interact with Year 1 students with the aim of reducing Year 1 students' stress and help them to adapt to their new environment and gain confidence during their first year of study. It also improves medical students' soft skills and professionalism (15).

The objectives of the study were to explore Big Sib students' perceptions of the educational environment at the SMS using the DREEM questionnaire and identify weak areas in the educational environment. Presumably, the Year 2 Big Sibs' perceptions of the educational environment influence their role as mentors to the Year 1 students and thereby influence the Year 1 students' perceptions as well. We hope to use the study findings as a basis for future studies of medical students' perceptions about the educational environment of the entire SMS.

Materials and Methods

This cross-sectional descriptive study was conducted among the Big Sib students at the SMS. The data were collected using internationally validated English version of the DREEM questionnaire. The questionnaires were distributed to all SMS Big Sib students ($n = 67$) at a regular face-to-face Big Sib session. Before the questionnaire was administered, the students were thoroughly briefed about the purpose of the study and the data collection process. They were also assured of their anonymity and the confidentiality of their responses. We also emphasized that the students' participation was voluntary and the return of the completed questionnaire would be considered implied consent. The students were asked to provide detailed information about their perceptions of the educational environment, and the completed questionnaires were collected by the researchers at the same session. Some educational terms and phrases, such as "factual learning", "ridicule", and "authoritarian", were explained before the respondents began the questionnaire. The entire data collection process took about 20 minutes. The collected data were analysed using SPSS version 12. A descriptive analysis of the collected data was completed.

The universal DREEM inventory

The DREEM inventory gives a total global score of 200 for 50 items. Each item is scored 0–4 (4 = strongly agree, 3 = agree, 2 = unsure, 1 = disagree, and 0 = strongly disagree) on a 5–

point scale. There are 9 negative items (Items 4, 8, 9, 17, 25, 35, 39, 48, and 50) scored in a reverse manner; high scores on these items indicate disagreement. The guidelines for interpreting the overall DREEM score are 0–50, very poor; 51–100, many problems; 101–150, more positive than negative; and 151–200, excellent. To indicate the different areas of the educational environment, the DREEM items are grouped into 5 subscales:

1. Students' Perception of Learning (SPoL) has 12 items, with a maximum score of 48 (satisfactory score = 24).
2. Students' Perception of Teaching (SPoT) has 11 items, with a maximum score of 44 (satisfactory score = 22).
3. Students' Academic Self-Perception (SASP) has 8 items, with a maximum score of 32 (satisfactory score = 16).
4. Students' Perception of Atmosphere (SPoA) has 12 items, with a maximum score of 48 (satisfactory score = 24).
5. Students' Social Self-Perception (SSSP) has 7 items, with a maximum score of 28 (satisfactory score = 14).

Items with a mean score of 3.5 or more are true positive points. Items with a mean of 2.0 or less should be examined more closely, as they indicate problem areas. Items with a mean between 2.0 and 3.0 are aspects of the educational environment that could be enhanced (16).

Results

Out of 67 students, 42 responded to the questionnaire, resulting in a response rate of 62.7%. Table 1 shows the DREEM global and subscale mean scores for the school. The global score was 117.9/200 (SD 14.6). The global score indicates that the Big Sib students' perceptions of the educational environment of the school were more positive than negative. The total mean score for SPoL was 28.3/48 (SD 4.1); SPoT was 26.0/44 (SD 3.7); SASP was 19.7/32 (SD 3.6); SPoA was 28.1/48 (SD 5.1); and SSSP was 15.8/28 (SD 2.6). The students perceived the educational environment of SMS positively for all 5 DREEM subscales.

Table 2 shows the individual item analysis of DREEM according to the 5 different subscales. For the SPoL subscale items, 9 out of 12 items scored between 2.00 and 3.00, and 4 items scored 2.00 or less. The mean score for Item 22 (*The teaching helps to develop my confidence*) was 1.88 (SD 0.89), which indicates that the teaching is not providing enough experiences that allow students

to develop their confidence. Item 25 (*The teaching over emphasizes factual learning**) was scored 1.69 (SD 0.78), meaning that students agreed with the statement. Students were unsure about Item 48 (*The teaching is too teacher centered**), which scored 2.00 (SD 0.82).

In the analysis of individual item of SPoT subscale, Items 8 (*The teachers ridicule the students**) and 9 (*The teachers are authoritarian**) scored 1.98 (SD 0.57) and 1.83 (SD 0.74), respectively. The negative-item scoring scheme indicated that students agreed with these 2 items. Items 39 (*The teachers get angry in teaching**) and 50 (*The students irritate the teachers**), both negative items, scored 2.43 (SD 1.06) and 2.40 (SD 0.88), respectively, indicating the students' disagreement with the items. The other 7 items scored between 2.00 and 3.00, indicating aspects of this domain that could be enhanced.

Out of 8 items in the SSAP subscale, only Item 27 (*I am able to memorize all I need*) had a mean score of 1.45 (SD 0.83), which indicates that students are mostly memorizing in their study. The other items scored between 2.00 and 3.00, indicating areas in this domain that could be improved.

Items 17 (*Cheating is a problem in this school**) and 35 (*I find the experience disappointing**), both negative items, in the SPoA subscale scored 2.02 (SD 0.92) and 2.24 (SD 0.92), respectively. The scores suggest that students did not fully agree with both statements. All items scored between 2.00 and 3.00 and could be improved.

The analysis of individual SSSP subscale, item indicates a problem area is Item 14 (*I am rarely bored in this course*), which had a mean score

of 1.64 (SD 1.00). Item 15 (*I have good friends in this course*) had mean score of 3.07 (SD 0.77), indicates a fairly good social life for the students. The other 5 items scored between 2.00 and 3.00, indicating a need for further enhancement.

Of the 50 items on the DREEM inventory, 42 items had mean scores between 2.00 and 3.00 and could be improved to enhance the educational environment at SMS. A total of 7 items scored below 2.00. These were identified as real problem areas in our school educational environment that require further exploration to pinpoint and rectify the underlying problems. Only 1 item scored 3.07, which indicates that there are no absolute positive aspects of our school educational environment.

Discussion

The DREEM questionnaire provided an overview of Big Sib students' perceptions about the educational environment at SMS and highlighted areas of concern. The overall DREEM mean score was 117.9/200, indicating that the Big Sib students' perceptions of the educational environment were more positive than negative. In comparison, the global DREEM global scores reported for different medical and allied health sciences schools were 133/200, 134/200, and 125/200 in Malaysia (17-19); 119/200, 114/200, and 107/200 in India (12,20); 108/200 in Sri Lanka (21); 130/200 in Nepal (13); 118/200 in Nigeria (13); 109/200 in Trinidad (14); and 139/200 in the United Kingdom (22). The DREEM score of 89/200 for the College of Medicine at King Saud University, Saudi Arabia (23) is reported to be the lowest score among published studies, followed

Table 1: The Dundee Ready Educational Environment Measure (DREEM) global and subscale mean scores for School of Medical Sciences (SMS), Universiti Sains Malaysia

Subscales	Maximum score	Mean	SD
1 Students' Perceptions of Learning (SPoL)	48	28.3	4.1
2 Students' Perceptions of Teachers (SPoT)	44	26.0	3.7
3 Students' Academic Self-Perceptions (SASP)	32	19.7	3.6
4 Students' Perceptions of Atmosphere (SPoA)	48	28.1	5.1
5 Students' Social Self-Perceptions (SSSP)	28	15.8	2.6
Global DREEM score	200	117.9	14.6

Table 2: Individual item analysis of DREEM by different subscales

Items	Mean	SD
Students' Perception of Learning (SPoL)		
1 I am encouraged to participate during teaching sessions	2.57	0.80
7 The teaching is often stimulating	2.40	0.73
13 The teaching is student-centred	2.29	0.65
16 The teaching helps to develop my competence	2.79	0.78
20 The teaching is well-focused	2.57	0.73
22 <i>The teaching helps to develop my confidence</i>	1.88	0.88
24 The teaching time is put to good use	2.31	0.86
25 <i>The teaching over-emphasizes factual learning*</i>	1.69	0.78
38 I'm clear about the learning objectives of the course	2.43	0.77
44 The teaching encourages me to be an active learner	2.55	0.94
47 Long-term learning is emphasized over short-term learning	2.64	0.65
48 <i>The teaching is too teacher-centred*</i>	2.00	0.82
Total mean score	28.30	4.10
Maximum score	48	
Students' Perception of Teachers (SPoT)		
2 The teachers are knowledgeable	2.88	0.63
6 The teachers adopt a patient-centred approach to consulting	2.42	0.67
8 <i>The teachers ridicule the students*</i>	1.98	0.57
9 <i>The teachers are authoritarian*</i>	1.83	0.79
18 The teachers have good communication skills with patients	2.63	0.69
29 The teachers are good at providing feedback to students	2.17	0.74
32 The teachers provide constructive criticism here	2.37	0.69
37 The teachers give clear examples	2.24	0.87
39 The teachers get angry in teaching*	2.43	1.06
40 The teachers are well-prepared for their teaching sessions	2.50	0.86
50 The students irritate the teachers*	2.40	0.88
Total mean score	26.00	3.70
Maximum score	44	
Students' Academic Self-Perception (SASP)		
5 Learning strategies that worked for me before continue to work for me now	2.52	0.59
10 I am confident about my passing this year	2.40	0.88
21 I fell I am being well prepared for my profession	2.62	0.85
26 Last year's work has been a good preparation for this year's work	2.68	0.78

27	<i>I am able to memorize all I need</i>	1.45	0.83
31	I have learnt a lot about empathy in my profession	2.69	0.86
41	My problem-solving skills are being well developed here	2.45	0.86
45	Much of what I have to learn seems relevant to a career in healthcare	2.98	0.51
Total mean score		19.70	3.60
Maximum score		32	

Students' Perception of Atmosphere (SPoA)

11	The atmosphere is relaxed during ward teaching	2.15	0.88
12	This school is well time-tabled	2.24	1.00
17	Cheating is a problem in this school*	2.02	0.92
23	The atmosphere is relaxed during lectures	2.52	0.83
30	There are opportunities for me to develop my interpersonal skills	2.74	0.76
33	I feel comfortable in class socially	2.55	0.73
34	The atmosphere is relaxed during class/ seminars/tutorials	2.45	0.88
35	I find the experience disappointing*	2.24	0.90
36	I am able to concentrate well	2.17	0.82
42	The enjoyment outweighs the stress of the course	2.05	1.08
43	The atmosphere motivates me as a learner	2.50	0.94
49	I feel able to ask the questions I want	2.20	0.50
Total mean score		28.10	5.10
Maximum score		48	

Students' Social Self-Perception (SSSP)

3	There is a good support system for students who get stressed	2.12	0.68
4	I am too tired to enjoy the course*	2.02	0.88
14	<i>I am rarely bored in this course</i>	1.64	1.00
15	I have good friends in this course	3.07	0.77
19	My social life is good	2.52	0.80
28	I seldom feel lonely	2.19	1.04
46	My accommodation is pleasant	2.14	1.00
Total mean score		15.80	2.60
Maximum score		28	

: negative item; italic: item scored 2 or less; italic: low-scored negative item

by 97/200 in the Canadian Memorial Chiropractic College study (2)

As is observed in this study, the scores for all 5 DREEM subscales reflected positive perceptions by the students. However, these ratings also indicated that there is ample room for improvement in all 5 domains of the educational environment at SMS. These results are comparable with many other reported findings (12–14,16,17,19).

There were 7 DREEM items that scored 2 or less (items in italic). Out of the 7 items, 4 of them were negative (items in italic, with asterisk); 2 of them belonged to the SPoL subscale (*The teaching over-emphasizes factual learning**, *The teaching is too teacher-centred**) and the other 2 belonged to the SPoT subscale (*The teachers ridicule the students**, *The teachers are authoritarian**). To a great extent, the students felt that the course is overloaded with factual information and is teacher-centred. They also felt that the teachers were strict and, at times, sarcastic about the students' shortcomings. These findings are consistent with the findings of Mayya & Roff (12). These findings are particularly interesting because they contradict our school teaching and learning philosophies. The school is using a student-centred, problem-based, integrated, and community-oriented approach in its teaching and learning. The students' reported perceptions to the contrary may be because the study was conducted at the very beginning of the new academic session. In Year 1, the students studied basic subjects in an integrated manner and they experienced fewer problem-based or independent sessions than students in other years, which may explain why the Year 2 Big Sib students perceived the program as more teacher-centred and fact-based.

Item 27 (*I am able to memorize all I need*) was the lowest-scored item, with a score of 1.45/4 (SD 0.83). This item scored below 2.0 in many other published articles (13,14,24,25). This finding might indicate that the curriculum volume needs further review and reduction for our school. Another low-scored item was Item 22 (*The teaching helps to develop my confidence*), which scored 1.88, indicating that the current teaching is not providing enough opportunities for the students to develop confidence. Item 14 (*I am rarely bored in this course*) scored 1.64 and needs to be explored further to identify what causes such boredom and whether the courses can be made more engaging. Students' perceptions for Item 4 (*I am too tired to enjoy the course**) were average, 2.02. Items 4 and 14 indicate a considerable amount of stress on the students.

There were 16 items that scored between 2.50 and 3.00. They were Items 1 (2.88), 16 (2.79), 44

(2.55), and 47 (2.64) of the SPoL domain; Items 2 (2.88), 18 (2.63), and 40 (2.50) of the SPoT domain; Items 5 (2.52), 21 (2.62), 26 (2.68), 31 (2.69), and 45 (2.98) of the SASP domain; Items 23 (2.52), 33 (2.55), and 43 (2.50) of the SPoA domain and Item 19 (2.52) of the SSSP domain. Students felt their teachers were knowledgeable, were well-prepared for their teaching and stimulated them to participate in teaching sessions. They also felt that the teachers were good at communicating with them, and that their teaching helped the students to develop professional competence. They also considered the overall atmosphere of school is comfortable and reported better-than-average social lives in Item 19 (2.52). Only 1 item, Item 15 (*I have good friends on this campus*) of the SSAP domain scored 3.07; this indicates that students have an overall good social life on campus. However, not a single item scored 3.50 or higher, which means there is no particularly excellent aspect of the educational environment of our medical school. Although this lack of any excellent aspect may be considered a shortcoming at the moment, it only means that we have a lot of room for improvement and improvisation in the school educational environment.

Considering all of the study's findings, our overall assumptions about the educational environment of SMS are as follows:

1. Overall, the SMS has a reasonably positive educational environment with ample room for improvement.
2. The teachers are knowledgeable and well-prepared for teaching, but they are overloading the students with factual information.
3. Teachers are strict and, to some extent, authoritarian.
4. Students are experiencing a considerable amount of stress.
5. Students' social life on campus is generally good.

Future directions

The small study population selected from a particular group with different sociocultural and educational backgrounds was identified as the main limitation of the study, meaning that the study findings cannot be generalised. We feel it is important to conduct a large scale study among all SMS students regarding their perceptions of the educational environment. We also recommended including more student-centred teaching and problem-based learning in Year 1. The Department of Medical Education should address issues such as factual teaching, teacher-centred teaching, and

the emphasis on memorizing over understanding by organizing more teacher-training programmes as a part of its regular faculty development programmes.

Conclusion

This pilot study revealed that Big Sib students perceived the educational environment of USM School of Medical Sciences positively. It also identified many problem areas (indicated by mean scores between 2.0 and 3.0 for most items) where remedial measures need to be introduced. Areas with scores of less than 2.0 need further exploration to pinpoint the underlying problems. Eventually, we need to ensure a favourable educational environment that will help our medical students achieve better academic performance and the personal and professional growth that will make them indispensable assets to our country.

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Authors' contributions

Conception and design, drafting, critical revision and final approval of the article: HA
Provision of study materials or patients, collection, analysis and interpretation of data, statistical expertise, administrative support: MSBY, SPC

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