

ASSESSMENT/EVALUATION

Students' Perceptions of Educational Environment: A Comparison of Academic Achievers and Under-Achievers at Kasturba Medical College, India

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ABSTRACT **Context:** No country, least of all poorly resourced countries such as India, can afford to lose too many medical students in their undergraduate years. It would be useful to have an instrument to identify those students who are vulnerable to academic failure at this level of training and to identify the features of the educational environment that they perceive differently from students who are succeeding academically in order to design intervention strategies. Gender differences in perceptions of the educational environment might well emerge in particular academic or cultural contexts, with particular curricula. The present study was motivated by this concern and focused on comparisons between academic achievers and under-achievers and male and female students of Kasturba Medical College, India.

Objectives: (1) To compare the perceptions of the educational environment of academic achievers and under-achievers and to identify problem areas that should be remediated. (2) To identify whether there is any gender difference in the perceptions.

Methods: The Dundee Ready Educational Environment Measure (DREEM) was administered to 508 medical students studying in the clinical years at the Kasturba Medical College in India. Item as well as scale scores were compared between academic achievers and under-achievers.

Findings: Overall sample of the present study rated educational environment in this institution as average. The overall mean DREEM score was significantly higher for academic achievers. Compared to under-achievers, academic achievers scored significantly higher on perceptions regarding teachers, academic atmosphere and social self-perceptions. In addition to this, the overall rating (total DREEM score) of female students was significantly less compared to males in the academically vulnerable group.

Conclusions: Perceptions of poor performers are significantly different from those of

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better performers in the same institution. More importance should be given to the perceptions of students to improve the educational environment, as perceptions are associated positively with learning outcome, learning approach and attitude toward studying. Use of the DREEM as a monitoring tool might permit timely interventions to remediate problematic educational environments.

KEYWORDS *India, educational environment, perceptions, remediation, intervention, undergraduate.*

Introduction

Students' perceptions of their educational environment are a useful basis for modifying and improving the quality of educational environment. One of the most important findings of educational research is that meaning orientation to learning is positively associated with students' perception of the learning environment. Ramsden and Entwistle (1981) reported positive relationships between teaching characteristics, meaning orientation to learning and positive attitude to studying. Their study has shown positive association between a scale representing good teaching (well prepared, helpful, committed teachers) with a scale representing meaning orientation to studying (deep approach, inter-relating ideas, use of evidence and intrinsic motivation). In a study conducted by Entwistle, Kozeki and Tait (1989), scale scores describing perceptions of school and teachers have shown positive relationships with level of motivation and approaches to learning. Pimparyon *et al.* (2000) observed significant positive relationships between meaning orientation and all the five scales of the medical education environment measure: students' perception of teaching and learning, teachers, academic atmosphere, self and social perceptions. Gender differences in perceptions of the educational environment might well emerge in particular academic or cultural contexts, with particular curricula. A comparative study of data from a Nigerian undergraduate medical school and a Nepalese health professions institution reported that female students seem to be significantly less pleased with the educational environment of both the institutions (Roff *et al.*, 2001).

The UK Standing Committee on Postgraduate Medical Education (SCOPME, 1991) highlighted the importance of the educational environment in their statement that "A working environment that is conducive to learning is critically important to successful training". To measure such an environment, Roff *et al.* (1997) developed the Dundee Ready Education Environment Measure (DREEM). The DREEM has been used in a dozen countries in medical schools, nursing colleges and other institutions preparing students for professions associated with medicine (Pimparyon *et al.*, 2000; Roff *et al.*, 2001; Bassaw *et al.*, 2003). It can produce global reading and diagnostic analyses of

undergraduate educational environments in medical schools and other health professions institutes.

Kasturba Medical College is a self-financing institute, attracting both Indian and international students. Before entering a new learning institution, students and their parents enquire about the teaching and learning environment in addition to social climate of the institution, as these are important in determining the nature of the learning experience. The institution also has an obligation to offer a 'fit-for-purpose' curriculum in an educational environment that will enhance the prospects of success of its students.

Objectives

(1) To compare the perceptions of educational environment of academic achievers and under-achievers and to identify problem areas that should be remediated. (2) To identify whether there is any gender difference in the perceptions.

Material and Methods

Instrument

The Dundee Ready Educational Environment Measure (DREEM) was used to collect data on educational environment (Roff *et al.*, 1997). The DREEM contains 50 statements relating to a range of topics directly relevant to the educational climate that had been generated by a Delphi panel of more than 80 international medical and health professions educators and validated in administration to students in a wide range of countries. Nine of the 50 items are negative statements. Each item should be scored 0 – 4 with 4 = Strongly agree, 3 = Agree, 2 = Unsure, 1 = Disagree and 0 = Strongly disagree. Negative items should be scored in reverse order so that the higher a score the more positive the perception for all items.

The inventory encompasses five subscales:

- Students' Perceptions of Learning (12 items/ maximum score 48).
- Students' Perceptions of Teachers (11 items/ maximum score 44).
- Students' Academic Self-perceptions (8 items/ maximum score 32).
- Students' Perceptions of Academic Atmosphere (12 items/ maximum score 48).
- Students' Social Self-perceptions (7 items/ maximum score 28).

Total 50 items with a maximum score 200.

This instrument is intended to measure and diagnose the environments of educational institutions in the healthcare professions. The instrument has shown a consistently high reliability in a variety of settings. Internal consistency coefficient Alpha computed from present data are shown in Table 1.

Table 1. Cronbach's alpha for scales and full DREEM inventory

| Scales | Academic achievers (<i>n</i> = 403) | Academic under-achievers (<i>n</i> = 105) | Combined group (<i>n</i> = 508) |
|--|--|--|--|
| Students' perceptions of learning | 0.78 | 0.78 | 0.79 |
| Students' perceptions of teachers | 0.71 | 0.72 | 0.72 |
| Students' academic self-perceptions | 0.72 | 0.78 | 0.74 |
| Students' perceptions of academic atmosphere | 0.77 | 0.76 | 0.77 |
| Students' social self-perceptions | 0.51 | 0.49 | 0.51 |
| Full DREEM inventory | 0.91 | 0.92 | 0.92 |

Alpha coefficients of the inventory and its subscales indicate that the instrument and its scales have adequate reliability for measurement in this medical college, although the coefficient for social self-perceptions is slightly low.

Sample

The survey of the educational environment was conducted in KMC, during the months of February and March, 2003. The 50-item Dundee Ready Educational Environment Measure (DREEM) was administered to students studying in the clinical years at the Kasturba Medical College in India. Students were given 20 minutes free time during the lecture class to respond to the inventory. All students present in the class on the day of the survey were asked to respond to the items of the inventory on a five point Likert-type scale. A total of 508 (max.=669) students responded to the inventory. The sample was classified as responses from those who failed at least once in the university examination (academic under-achievers, *n*=105, max.=147) and those who did not experience failure (academic achievers, *n*=403, max.=522) till the day of the survey, during their medical education. Item as well as scale scores were compared between academic achievers and under-achievers at 5% level of significance, applying the students' t-test.

Results

Of the 403 academic achievers in our sample, 231 were males and 172 were females. Their mean age was 21.53 years (SD=1.74) and 20.95 years (SD=1.78) respectively. Of the 105 academic under-achievers, 64 were males and 41 were females. Their mean age was 21.95 (SD=2.35) years and 21.37 (SD=1.5) years respectively.

Global rating and perceptions

The mean DREEM score for the school from the overall sample ($n = 508$) was 107.44/200 with a SD of 24.95. The score indicates that, overall, students have more positive than negative perceptions.

Sub-scale ratings and perceptions

The mean score for perception of learning was 25.05/48 (SD = 7.12); for perceptions of teachers 24.57/44 (SD = 6.05); for academic self-perceptions 17.98/32 (SD = 5.08); for perceptions of atmosphere 25.54/48 (SD = 7.61) and for social self-perceptions 14.32/28 (SD = 4.28). Mean scale scores indicate that students' rated all five dimensions of the educational environment in this institution as average.

Difference between academic achievers and underachievers

Table 2 shows mean item, scale and global scores, and significant differences between the ratings of academic achievers and under-achievers.

Compared to under-achievers, academic achievers have significantly more positive perceptions regarding teachers, academic atmosphere and social self-perceptions (Table 2). Mean scale scores indicate that achievers' perceptions regarding all five dimensions of the educational environment are more positive than negative. The overall mean DREEM score is significantly higher for academic achievers.

Mean scores of individual items indicate that there are 24 items with a mean of 2 or less. These are the problem areas requiring improvement. The mean score is between 2 and 3 for all the remaining items of the inventory. These are aspects of the environment that could be enhanced even for the academic achievers (Table 2).

Mean scores of academic under-achievers on individual items indicate that there are 24 items with a mean of 2 or less. These are the problem areas requiring investigation and possible intervention. The mean score is between 2–3 for all the remaining items of the inventory. Scores on various scales indicate that they are somewhat negative in their perceptions of learning and teachers. The score on Students' Perceptions of Academic Atmosphere indicate that there are many issues which need to be addressed. Students are not happy regarding the social environment. However, overall both groups showed more positive than negative perceptions (Table 2).

Gender-wise comparison

The items with statistically significant mean scores between the male and female students are given in Tables 3 and 4 respectively.

In academic achievers, males were less bored with this course compared to female students, and they perceived that teachers get angry in class significantly less than do the female achievers. The items representing course enjoyment, atmosphere during seminars/tutorials, clarity of examples,

Table 2. Response to DREEM item and scale scores – medical students of clinical years

| Item No | Item | Academic achievers (n = 403) | | Academic under-achievers (n = 105) | |
|---------|--|---------------------------------|------|---------------------------------------|------|
| | | Mean | SD | Mean | SD |
| 1 | I am encouraged to participate in class | 2.10 | 1.15 | 2.35 ^a | 1.11 |
| 2 | The teachers are knowledgeable | 2.92 | 0.75 | 2.94 | 1.02 |
| 3 | There is a good support system for students who get stressed | 1.34 | 1.07 | 1.24 | 1.11 |
| 4 | I am too tired to enjoy the course | 1.69 | 1.36 | 1.41 ^a | 1.12 |
| 5 | Learning strategies which worked for me before continue to work for me now | 2.04 | 1.07 | 1.90 | 1.14 |
| 6 | The teachers are patient with patients | 2.55 | 1.03 | 2.34 | 1.05 |
| 7 | The teaching is often stimulating | 2.03 | 1.08 | 1.96 | 1.18 |
| 8 | The teachers ridicule the students | 1.99 | 1.14 | 1.46 ^c | 1.15 |
| 9 | The teachers are authoritarian | 1.52 | 1.01 | 1.15 ^c | .99 |
| 10 | I am confident about my passing this year | 2.98 | 1.00 | 2.58 ^c | 1.05 |
| 11 | The atmosphere is relaxed during the ward teaching | 2.09 | 1.18 | 1.88 | 1.12 |
| 12 | This school is well time-tabled | 2.39 | 1.41 | 1.90 ^c | 1.38 |
| 13 | The teaching is student centred | 2.21 | 1.14 | 2.06 | 1.13 |
| 14 | I am rarely bored on this course | 1.59 | 1.24 | 1.51 | 1.16 |
| 15 | I have good friends in this school | 2.82 | 1.15 | 2.73 | 1.12 |
| 16 | The teaching helps to develop my competence | 2.18 | 1.08 | 2.30 | 1.12 |
| 17 | Cheating is a problem in this school | 2.42 | 1.39 | 1.70 ^c | 1.46 |
| 18 | The teachers have good communications skills with patients | 2.72 | 0.96 | 2.47 ^a | 1.12 |
| 19 | My social life is good | 2.60 | 1.11 | 2.29 ^a | 1.22 |

(continued overleaf)

Table 2. (continued)

| Item No | Item | Academic achievers (<i>n</i> = 403) | | Academic under-achievers (<i>n</i> = 105) | |
|---------|---|---|------|---|------|
| | | Mean | SD | Mean | SD |
| 20 | The teaching is well focused | 2.52 | .98 | 2.35 | 1.03 |
| 21 | I feel I am being well prepared for my profession | 2.16 | 1.07 | 2.49 ^b | 1.19 |
| 22 | The teaching helps to develop my confidence | 2.03 | 1.03 | 2.10 | 1.15 |
| 23 | The atmosphere is relaxed during lectures | 2.26 | 1.17 | 2.05 | 1.12 |
| 24 | The teaching time is put to good use | 2.10 | 1.16 | 2.14 | 1.19 |
| 25 | The teaching over-emphasizes factual learning | 1.44 | 1.01 | 1.37 | 1.06 |
| 26 | Last year's work has been a good preparation for this year's work | 2.26 | 0.99 | 2.26 | 1.22 |
| 27 | I am able to memorize all I need | 1.73 | 1.16 | 1.70 | 1.25 |
| 28 | I seldom feel lonely | 2.05 | 1.29 | 1.98 | 1.32 |
| 29 | The teachers are good at providing feedback to students | 2.17 | 1.04 | 1.86 ^c | 1.18 |
| 30 | There are opportunities for me to develop interpersonal skills | 1.97 | 1.14 | 1.90 | 1.20 |
| 31 | I have learned a lot about empathy in my profession | 2.43 | 1.03 | 2.34 | 1.17 |
| 32 | The teachers provide constructive criticism here | 2.16 | 1.04 | 1.79 ^b | 1.19 |
| 33 | I feel comfortable in class socially | 2.60 | 1.03 | 2.44 | 1.13 |
| 34 | The atmosphere is relaxed during seminars/tutorials | 2.37 | 1.02 | 2.25 | 1.03 |
| 35 | I find the experience disappointing | 2.21 | 1.15 | 2.13 | 1.19 |
| 36 | I am able to concentrate well | 2.07 | 1.04 | 2.03 | 1.09 |
| 37 | The teachers give clear examples | 2.36 | 1.01 | 2.33 | 1.05 |
| 38 | I am clear about the learning objectives of the course | 2.63 | 0.92 | 2.53 | 1.08 |

(continued overleaf)

Table 2. (continued)

| Item No | Item | Academic achievers (<i>n</i> = 403) | | Academic under-achievers (<i>n</i> = 105) | |
|---------|---|---|-------|---|-------|
| | | Mean | SD | Mean | SD |
| 39 | The teachers get angry in class | 1.95 | 1.19 | 1.42 ^c | 1.13 |
| 40 | The teachers are well prepared for their classes | 2.68 | 0.92 | 2.65 | 0.96 |
| 41 | My problem solving skills are being well developed here | 1.95 | 1.05 | 1.89 | 1.17 |
| 42 | The enjoyment outweighs the stress of the course | 1.66 | 1.22 | 1.32 ^a | 1.17 |
| 43 | The atmosphere motivates me as a learner | 2.00 | 1.19 | 1.82 | 1.12 |
| 44 | The teaching encourages me to be an active learner | 2.00 | 1.11 | 1.95 | 1.16 |
| 45 | Much of what I have to learn seems relevant to a career in healthcare | 2.48 | 0.99 | 2.60 | 1.09 |
| 46 | My accommodation is pleasant | 2.44 | 1.23 | 2.33 | 1.35 |
| 47 | Long term learning is emphasized over short term learning | 2.14 | 1.15 | 1.95 | 1.24 |
| 48 | The teaching is too teacher-centred | 1.77 | 1.03 | 1.51 ^a | 1.07 |
| 49 | I feel able to ask the questions I want | 2.04 | 1.21 | 2.02 | 1.19 |
| 50 | The students irritate the teachers | 2.11 | 1.33 | 1.99 | 1.38 |
| | Students' perception of learning | 25.16 | 7.01 | 24.59 | 7.53 |
| | Students' perceptions of teachers | 25.13 | 5.85 | 22.40 ^c | 6.30 |
| | Students' academic self-perceptions | 18.04 | 4.87 | 17.74 | 5.83 |
| | Students' perceptions of academic atmosphere | 26.09 | 7.56 | 23.42 ^c | 7.50 |
| | Students' social self-perceptions | 14.53 | 4.29 | 13.50 ^a | 4.19 |
| | Total DREEM score | 108.95 | 24.40 | 101.65 ^b | 26.25 |

Mean score comparison of academic achievers and under-achievers: ^a*p* < 0.05, ^b*p* < 0.01, ^c*p* < 0.001.

Table 3. Items showing significant differences between male and female academic achievers

| Item no. | | Males = 231 | | Females = 172 | | T | Sig. |
|----------|---|-------------|------|---------------|------|-------|--------|
| | | Mean | SD | Mean | SD | | |
| 4 | I am too tired to enjoy the course | 1.57 | 1.37 | 1.86 | 1.33 | 2.15 | < 0.05 |
| 14 | I am rarely bored on this course | 1.69 | 1.29 | 1.44 | 1.17 | 2.01 | < 0.05 |
| 34 | The atmosphere is relaxed during seminars/tutorials | 2.27 | 1.09 | 2.49 | .91 | 2.22 | < 0.05 |
| 37 | The teachers give clear examples | 2.27 | 1.06 | 2.47 | .93 | 1.994 | < 0.05 |
| 39 | The teachers get angry in class | 2.09 | 1.25 | 1.76 | 1.10 | 2.81 | < 0.01 |
| 45 | Much of what I have to learn seems relevant to a career in healthcare | 2.35 | 1.06 | 2.65 | .86 | 3.15 | < 0.01 |
| 46 | My accommodation is pleasant | 2.27 | 1.30 | 2.66 | 1.09 | 3.221 | 0.001 |

relevance of the topics to be learned and student's accommodation environment were rated significantly low by male students compared to females (Table 3). On the other hand in academic under-achievers, items representing student's confidence about passing, atmosphere during ward teaching, student-centred teaching, student's social life and usefulness of teaching to develop student's confidence were rated significantly high by male students compared to females (Table 4).

Genderwise, there was no significant difference in the mean ratings for the five subscales of DREEM in academic achievers as well as under-achievers. However, the overall rating (total DREEM score) of female students was significantly less compared to males among the academic under-achievers. This difference is not observed in academic achievers.

Discussion

Global as well as scale-wise, overall sample rated the educational environment in this institution as average. The rating indicates that there is scope for improvement in all the five dimensions of educational environment. DREEM global score of a Nigerian medical school was reported as 118/200 and that of a Nepalese health professions institution was reported as 130/200 (Roff *et al.*, 2001). DREEM global score of the faculty of medical sciences in Trinidad

Table 4. Items showing significant differences between male and female academic under-achievers

| Item no. | Item | Males = 64 | | Females = 41 | | t | Sig. |
|----------|--|------------|-------|--------------|-------|-------|---------|
| | | Mean | SD | Mean | SD | | |
| 10 | I am confident about my passing this year | 2.84 | 1.03 | 2.17 | 0.97 | 3.34 | 0.001 |
| 11 | The atmosphere is relaxed during the ward teaching | 2.14 | 1.13 | 1.46 | 1.00 | 3.14 | 0.002 |
| 13 | The teaching is student centred | 2.36 | 1.01 | 1.59 | 1.16 | 3.61 | < 0.001 |
| 19 | My social life is good | 2.52 | 1.18 | 1.93 | 1.21 | 2.47 | < 0.02 |
| 22 | The teaching helps to develop my confidence | 2.30 | 1.18 | 1.80 | 1.05 | 2.17 | < 0.05 |
| | Total DREEM score | 105.78 | 27.34 | 95.2 | 23.34 | 2.046 | < 0.05 |

was reported as 109.9 (Bassaw *et al.*, 2003). We feel that these scores are not comparable with the global score of our sample, as the students in our school were from different nations and away from their parents. Perception of the environment may vary with the educational background of the students from different regions. Varying pronunciation and accent of English language of teachers as well as students is one of the factors that may influence students' perceptions in our school.

The ratings of academic achievers and under achievers suggest that perceptions about the educational environment are associated with learning outcome. There are studies in the literature suggesting that failing students perceive their learning context in atypical ways. Meyer and his colleagues (Meyer *et al.*, 1990) carried out a prospective analysis of failing students which showed that, for under-achieving students, the usual linkages between approaches to learning and perceptions of the learning environment were rarely found. These findings were later supported by Entwistle, Meyer and Tait (1991).

Important findings of the present study are the clearly identified differences in perceptions of the same educational environment between academic achievers and under-achievers. The academic under-achievers have significantly lower scores on perceptions of teachers, perceptions of academic atmosphere, social self-perceptions and the total DREEM score than the academic achievers. These findings are consistent with those of Pimparyon *et al.* (2000) that low academic achievement is characterized by less satisfaction with the educational environment.

Item-wise ratings of the two groups suggest that all aspects of the climate could be enhanced. Students in general are more critical about the quality of teaching and the general climate of the school, especially in the areas of student

participation in the class, over-emphasizing of factual learning and the authoritarian attitudes of teachers. Improvement in feedback to students, constructive criticism, training in learning strategies and problem solving skills are some of the important aspects. Opportunities to develop interpersonal skills are to be increased. Studying is found stressful and students were less satisfied with the support system for stressed students.

Gender-wise, the overall rating (total DREEM score) of female students was significantly less compared to males in the academically vulnerable group. Roff *et al.* (2001) have reported similar gender differences in Nigerian and Nepalese students. Item scores indicate that some of the aspects, such as lack of confidence in passing the exam and quality of social life, may be treated separately for female students.

Conclusion

Continuous quality improvement and innovation are very essential in a medical school. Perceptions of poor performers are significantly different from those of better performers in the same institution. The DREEM is a reliable and validated instrument that identifies specific problem areas within an institution, for different components of the same student body. More importance should be given to the perceptions of students to improve the educational environment as perceptions are associated positively with learning outcome, learning approach and attitude to studying. Positive attitudes and deep approach are linked with academic progress. Use of the DREEM as a monitoring tool might permit timely interventions to remediate problematic educational environments.

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