

---

## Dental students' perceptions of Learning Environment

Tipruthai Prayoonwong<sup>1</sup>, Chaichana Nimnuan<sup>2</sup>

### Abstract

**Objective:** To identify dental students' perceptions of the learning environment (LE) at the Faculty of Dentistry, Naresuan University in the academic year 2009.

**Methods:** Measure of pre-clinical dental students' LE was systematically developed. A cross-sectional survey was conducted using the LE questionnaires. All pre-clinical dental students at Naresuan University, Thailand, in the academic year 2009 were invited to participate.

**Result:** The LE questionnaire consisting of 43 items (9 dimensions) was developed with good validity and reliability. Cronbach's coefficient alpha ranged from 0.70-0.91. A total 215 pre-clinical dental students completed the questionnaire (96% response rate). The overall mean score was 57.4 (out of a maximum of 90) indicating relative satisfaction with the perceived environment. Of those 9 dimensions; "Health and stress" was ranked the lowest which was identified as an *issue which needs changing*.

**Conclusion:** Learning Environment for pre-clinical phase of dental education can be reliably measured. "Health and stress" was probably the dimension need to be improved by responsible dental educators.

Key words: dental education, pre-clinical

---

### Introduction

Nowadays, the students' perception is of fundamental importance that provides valuable feedback of the efficiency and acceptability of educational methods and learning experience (Henzi *et al.*, 2005). Students' perception of the learning environment is a useful basis for modifying and improving its quality and provides students with a louder voice by which they can share their experience in the school. Course evaluation is used to identify strengths and weaknesses of courses. In Naresuan University, the dental students completed course evaluation at the end of course. However, students were often surprised to learn that comments placed on evaluations or surveys usually do not affect the course from one year to the next.

The failure of addressing important issues related to dental school education might due to the students not being asked to reflect on the overall curricular experience and the entire learning environment.

Interest in the role of the learning environment in undergraduate health schools has been increasing recently. Educational environment is one of the most important factors determining the success of an effective curriculum and the quality of educational environment is crucial for effective learning (Bassaw *et al.*, 2003).

The aim of the present study was to identify the dental students' perceptions of the Learning Environment (LE) in the Faculty of Dentistry, Naresuan University. Results from this study will assist the institution to identify areas of concern and to foster learning environments that enhance academic achievement.

### Methods

This cross-sectional descriptive study was conducted in dental students at Naresuan University in the academic year 2009.

---

<sup>1</sup>Department of Preventive Dentistry, Faculty of Dentistry, Naresuan University

<sup>2</sup>Department of Psychiatry, Faculty of Medicine, Chulalongkorn University, Thailand.

Corresponding author: Chaichana Nimnuan  
Department of Psychiatry, Faculty of Medicine  
Chulalongkorn University, Rama IV Road, Patumwan,  
Bangkok 10330, Thailand

### **Developing a measure for LE**

'Learning Climate Measures for Thai Medical Education' was the original questionnaire developed for assessing the learning climate for Thai medical education (Wangsaturaka, 2005). This questionnaire was chosen because the content was relevant to all Thai health professions education. The 40-item questionnaire (9 dimensions) was modified to fit the specific content of the dental school. A 5-point Likert scale was chosen as the response option for all items. Answering options were scored as follows: strongly disagree (1); disagree (2); uncertain (3); agree (4); and strongly agree (5). Five independent content experts' opinions and results from cognitive interview conducted in 15 selected dental students were examined to assure content validity, comprehension and acceptability.

As a result, the 50-items questionnaire was drafted and then piloted among 338 pre-clinical dental students (Year 1 to 3) from two dental schools. Construct validity was examined using Factor Analysis. Reliability was examined based on internal consistency (Cronbach's alpha). Items were retained if they had item-scale correlations of 0.3 or higher. The sample size was judged to be adequate for above assessments of validity and reliability (Guadagnoli & Velicer, 1988; Nunnally, 1978; Tabachnick & Fidell, 2001).

After the pilot, 43 items remained and factor analysis showed 9 dimensions were well explained by the data. Dimensions were named as: Teacher to student interaction; Teaching skill; Handouts; Laboratory environment; Learning experience; Friends; Health and stress; Physical environment; and Institutional environment. The Cronbach's coefficient alpha ranged from 0.70 - 0.91, an acceptable level of reliability.

For interpretation, domain and overall mean score, the Dundee Ready Education Environment Measure (DREEM)'s was adopted (McAleer, 2001). The scores were simply divided into four levels. Due to unequal score for each dimension, we transformed raw scores into a 0 – 10 point scale in all dimensions in order to compare the magnitude among dimensions. Score interpretations are shown in Table 1 and Table 2.

### **Survey method**

The questionnaires were distributed to all pre-clinical dental students (Year 1 to 3) at Naresuan dental school. Data were analyzed

using descriptive statistics. Test of statistical significant differences among class years for the level of LE (outcome) was one-way ANOVA. All statistics were performed by SPSS version 11.5 for Windows. Statistical test was two-tailed and significant value was set at P-value < 0.05.

The proposal was submitted for approval by the ethics committee of Naresuan University and the Institutional Review Board (IRB) of Faculty of Medicine, Chulalongkorn University, Thailand. Informed consent was obtained from every participant before the survey was conducted.

**Table 1: Interpretation of the domain mean scores**

Scores	Interpretations
0 – 2.5	A terrible environment.
2.6 – 5.0	There are many issues which need changing.
5.1 – 7.5	Moving in the right direction.
7.6 – 10.0	A good feeling overall

**Table 2: Interpretation of the overall mean score  
(Maximum total mean score = 90)**

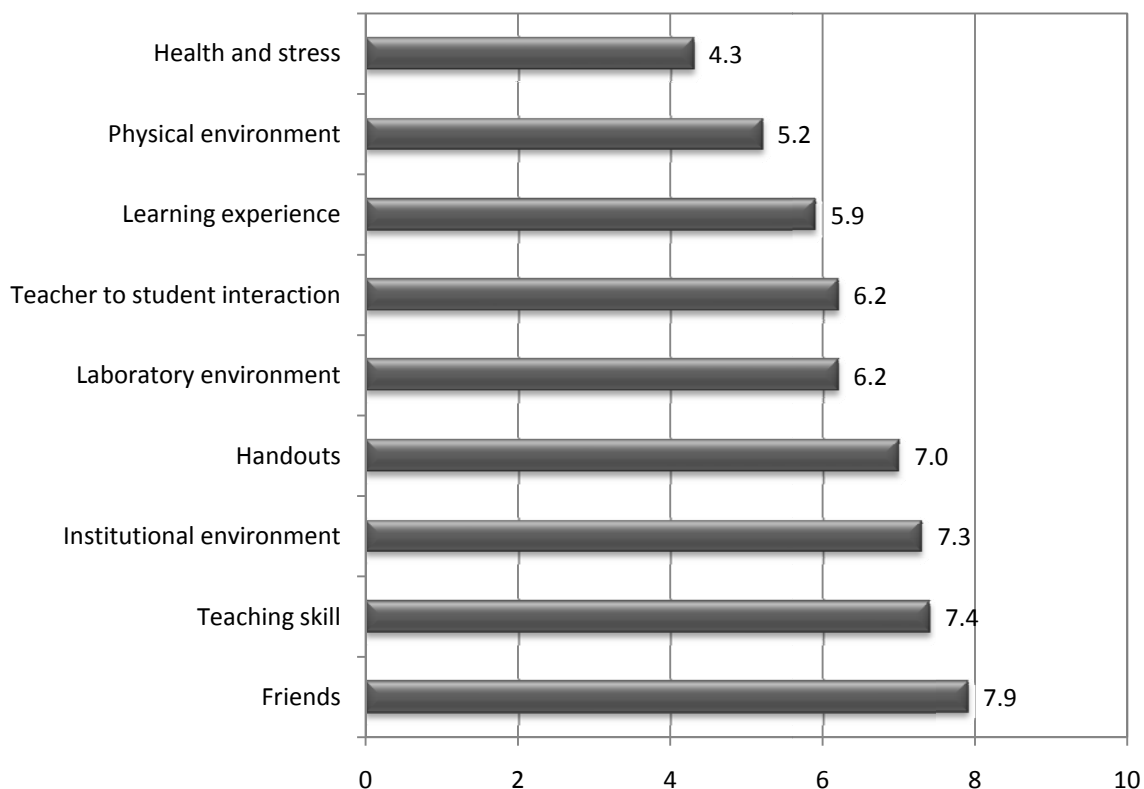
Scores	Interpretations
0 – 22.5	Very poor
22.6 – 45.0	Plenty of problems
45.1 – 67.5	More positive than negative
67.6 – 90.0	Excellent

### **Results**

The survey was conducted in January 2010. Two hundred and fifteen out of 224 pre-clinical dental students (96%) at Naresuan dental school completed the questionnaire. 59 were male (27.4%) and 153 female (71.2%). Three (1.4%) had not indicated their gender. The overall mean score was 57.4 within 'positive' (rather than 'negative') learning environment.

The ranking domain mean scores are shown in Figure 1. "Health and stress" was rated as the lowest dimension which was in the category of many issues which need changing (mean score 4.3). On the other hand, "Friends" was rated as the highest which was in a good feeling overall (mean score 7.9) category. The other dimensions were identified as moving in the right direction.

**Figure 1: The domain mean scores of each dimension for pre-clinical phase**



**Gender difference**

Although pre-clinical male students tended to have higher domain mean scores than females in all dimensions except “Handout” and “Institutional environment” dimension, none showed significant differences (Table 3).

**Class year differences**

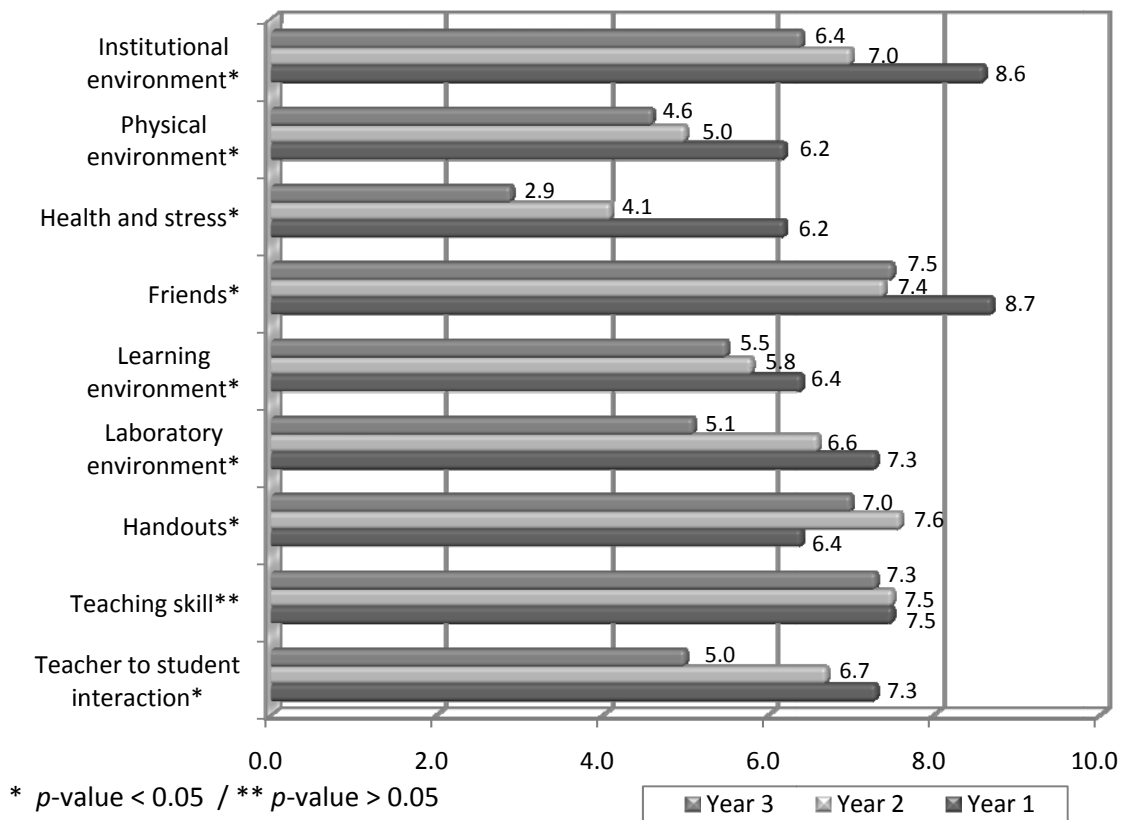
There were significant differences in all domain mean scores in the pre-clinical year except the “Teaching skill” dimension. The

results from post hoc comparison revealed that domain mean scores in “Teacher to student interaction”, “Laboratory environment”, “Health and stress”, and “Institution environment” dimensions tended to decrease across the class year as shown in Figure 2. In addition, the consistent findings among year 1 to 3 were the two lowest dimensions which were “Health and Stress” and “Physical Environment”

**Table 3: Domain mean (SD) scores according to gender**

Dimensions	Male	Female	p value
Teachers to student interaction	6.4 (1.58)	6.2 (1.52)	0.365
Teaching skill	7.5 (1.24)	7.4 (1.22)	0.431
Handouts	6.9 (1.41)	7.0 (1.52)	0.660
Laboratory environment	6.4 (1.90)	6.2 (1.81)	0.392
Learning experience	6.1 (1.80)	5.8 (1.60)	0.216
Friends	7.9 (1.77)	7.8 (1.69)	0.810
Health and stress	4.6 (2.40)	4.2 (2.24)	0.200
Physical environment	5.4 (1.73)	5.2 (1.48)	0.277
Institutional environment	7.3 (2.01)	7.3 (1.75)	0.938

**Figure 2: Domain mean scores of class years**



**Discussion**

In pre-clinical phase, “Health and stress” was identified as the lowest rated domain. It might reflect limited leisure time which was one of the most common concerns and stress-provoking factors as suggested by others (Rajab, 2001; Divaris *et al.*, 2008). Stress is unanimously accepted as a major contributing factor responsible for reduced performance, inability to concentrate, depression and other debilitating effects (Stewart *et al.*, 2006; Morse & Dravo, 2007; Pau *et al.*, 2007).

Regarding the results of gender differences in the learning environment, it was notable that none of the dimensions showed significant differences. This finding contrasts with a number of previous studies that revealed significant sex differences in health professional students’ perceptions of educational environment (Dunne *et al.*, 2006; Bassaw *et al.*, 2003; Roff *et al.*, 2001; Till, 2004) with the exception of Miles and Leinster’s (2007), which showed no gender differences in any of the five subscales of the DREEM questionnaire. The relationship between gender and learning environment is therefore far from clear.

In Year 1, the lowest dimension of ranking was the “Health and stress” dimension, a finding that might be attributed to the introduction and adaptation to higher education which is the transition from the secondary school to the university. Moreover, most students have to deal with not only studying general education courses but also participating in a large proportion of extracurricular activities.

Taking all these into consideration, it is not surprising that most of the first-year dental students might feel exhausted and lack time to relax. This finding supported that of Polychronopoulou and Divaris (2005) which indicated that first year students were the most concerned about “lack of time for relaxation” which might be attributed to the introduction to dental studies.

In Year 2, the dental students study alongside with medical students. A large proportion of contents in biomedical science are mainly taught in medical context. Thus, factual knowledge becomes overloaded and it was deemed unnecessary for their profession. Kristensen *et al.* (2009) suggested that dental students needed a dental context for the

health science courses for its relevance. This may then be a possible explanation for students' stress and perception of unfavourable physical environment.

Four out of nine dimension scores tended to decrease across the class year, the lowest were in Year 3. These findings might imply that Year 3 should be primarily concerned in the pre-clinical phase. The lowest domain mean scores in Year 3 was the "Health and stress" dimension. It was possibly due to the nature of study in the third year which students have to deal with lectures and laboratory practices of biomedical and dental science.

Based on the studies of psychological stress in undergraduate dental students, Pisarnaturakit (2003) revealed that extensive workload was more potential cause of stress in dental students in Thailand. While the three highest stressors in Year 3 of Nigerian dental students were: lack of time for relaxation; amount of assigned work; and receiving criticism from supervisors, respectively (Sofola & Jeboda, 2006). Polychronopoulou and Divaris (2005) also indicated that students in the third year were most affected by the acquisition of manual skills in laboratory and pre-clinical works. Workload or assignments especially from dental laboratory practices might be an explanation of the lowest domain mean score in "Health and stress" dimension for Year 3.

It is important to note that this study was cross-sectional in nature and the results might be influenced by class/generation norms. Moreover, the study setting was specific to local Thai context. If the results obtained from this study were used to apply somewhere else, the interpretation should be made with cautions.

## Conclusion

Learning Environment for the pre-clinical phase of dental education can be measured using a standardized questionnaire, systematically developed with acceptable validity and reliability. Among 9 dimensions; "Health and stress" dimension might be of primary concern and thus need improvement. To understand students' concerns generally would help faculty and administrators modify or change existing programmes to meet students' needs that have been identified as unfavourable

## References

- Bassaw, B., Roff, S., McAleer, S., Roopnarinesingh, S., De Lisle, J., Teelucksingh, S. & Gopaul, S. (2003) Students' perspectives on the educational environment, Faculty of Medical Sciences, Trinidad, *Medical Teacher*, 25, pp. 522-526.
- Divaris, K., Barlow, P.J., Chendea, S.A., Cheong, W. S., Dounis, A., Dragan, I. F. *et al.* (2008) The academic environment: the students' perspective, *European Journal of Dental Education*, 12 (1), pp. 120-130.
- Dunne, F., McAleer, S. & Roff, S. (2006) Assessment of the undergraduate medical education environment in a large UK medical school, *Health Education Journal*, 65, pp. 149-158.
- Guadagnoli, E. & Velicer, W.F. (1988) Relation of sample size to the stability of component Patterns, *Psychological Bulletin*, 103, pp. 265-275.
- Henzi, D., Davis, E., Jasinevicius, R., Hendricson, W., Cintron, L. & Isaacs, M. (2005) Appraisal of the dental school learning environment: the students' view, *Journal of Dental Education*, 69, pp. 1137-1147.
- Kristensen, B.T., Netterstrom, I. & Kayser, L. (2009) Dental students' motivation and the context of learning, *European Journal of Dental Education*, 13, pp. 10-14.
- McAleer, S., Roff, S. (2001) A practical guide to using the Dundee Ready Education Measure (DREEM), IN Genn, J. M. (Ed.) AMEE Medical Education Guide No. 23: *Curriculum, environment, climate, quality and change in medical education - A unifying perspective*. Dundee, UK: Association of Medical Education in Europe.
- Miles, S. & Leinster, S.J. (2007) Medical students' perceptions of their educational environment: Expected versus actual perceptions, *Medical Education*, 41, pp. 265-272.
- Morse, Z. & Dravo, U. (2007) Stress levels of dental students at the Fiji School of Medicine, *European Journal of Dental Education*, 11, pp. 99-103.
- Nunnally, J. (1978) *Psychometric theory*, New York: McGraw-Hill.
- Pau, A., Rowland, M.L., Naidoo, S., Abdulkadir, R., Makrynika, E., Moraru, R. *et al.* (2007) Emotional intelligence and perceived stress in dental undergraduates: a multinational survey, *Journal of Dental Education*, 71, pp. 197-204.

- Pisarnturakit, P. (2003), *Source of stress in Chulalongkorn University dental students*, MSc. thesis, Chulalongkorn University.
- Polychronopoulou, A. & Divaris, K. (2005) Perceived sources of stress among Greek dental students, *Journal of Dental Education*, 69, pp. 687-692.
- Rajab, L.D. (2001) Perceived sources of stress among dental students at the University of Jordan, *Journal of Dental Education*, 65, pp. 232-241.
- Roff, S., Mcaleer, S., Ifere, O.S. & Bhattacharya, S. (2001) A global diagnostic tool for measuring educational environment: comparing Nigeria and Nepal, *Medical Teacher*, 23, pp. 378-382.
- Sofola, O.O. & Jeboda, S.O. (2006) Perceived sources of stress in Nigerian dental students, *European Journal of Dental Education*, 10, pp. 20-23.
- Stewart, D.W., De Vries, J., Singer, D.L., Degen, G.G. & Wener, P. (2006) Canadian dental students' perceptions of their learning environment and psychological functioning over time, *Journal of Dental Education*, 70, pp. 972-981.
- Tabachnick, B.G. & Fidell, L.S. (2001) *Using Multivariate Statistics*, Boston: Allyn and Bacon.
- Till, H. (2004) Identifying the perceived weaknesses of a new curriculum by means of the Dundee Ready Education Environment Measure (DREEM) inventory, *Medical Teacher*, 26, pp. 39-45.
- Wangsaturaka, D. (2005), *Development of learning climate measures for Thai medical education*, PhD thesis, University of Dundee.