



## APPRAISAL OF STUDENTS' PERCEPTION OF PROSTHODONTIC LEARNING ENVIRONMENT IN MORADABAD, NORTH INDIA.

### Prosthodontics

<b>Dr. Siddhi Tripathi*</b>	Reader, Department of Prosthodontics and Crown & Bridge, Kothiwal Dental College & Research Centre, Moradabad-244001, Uttar Pradesh, India *Corresponding Author
<b>Dr. Kanasha Abrol</b>	Post-graduate student, Department of Prosthodontics and Crown & Bridge, Kothiwal Dental College & Research Centre, Moradabad-244001, Uttar Pradesh, India
<b>Dr. Swatantra Agarwal</b>	Professor and Head, Department of Prosthodontics and Crown & Bridge, Kothiwal Dental College & Research Centre, Moradabad-244001, Uttar Pradesh, India
<b>Dr. Rachna Maheshwari</b>	Reader, Department of Prosthodontics and Crown & Bridge, Kothiwal Dental College & Research Centre, Moradabad-244001, Uttar Pradesh, India
<b>Dr. Nimra Mehraj</b>	Post-graduate student, Department of Prosthodontics and Crown & Bridge, Kothiwal Dental College & Research Centre, Moradabad-244001, Uttar Pradesh, India
<b>Dr. Ashish Sharma</b>	Professor, Department of Oral and Maxillofacial Surgery, Kothiwal Dental College & Research Centre, Moradabad-244001, Uttar Pradesh, India

### ABSTRACT

**Objectives:** Dental curriculum especially prosthodontics is elaborative, challenging and difficult to conceptualize while co-relating theoretical and clinical aspects. In this regard, students constitute a stakeholder group that provides unique information concerning effectiveness of the dental curriculum. Hence, a study was conducted to elicit and compare the differences in perception of the prosthodontic learning environment between the preclinical and clinical years of under-graduate curriculum and between under-graduate and post-graduate students of prosthodontics in a dental teaching institute in Moradabad, India.

**Methods:** A total number of 400 students participated in the study. A sixty-item closed-ended DCLES cross-sectional questionnaire was completed by the dental graduates (including interns) and post-graduate students. The data obtained was statistically analyzed.

**Results:** With regard to perception of the prosthodontic learning environment statistically significant differences were found in flexibility, supportiveness, meaningful experience, organization and breadth of interest between pre-clinical and clinical years of undergraduate students ( $p < 0.05$ ). When under-graduates and post-graduates were compared, significant differences were found in student to student interaction and emotional climate.

**Conclusion:** The study highlighted the areas of strength and weakness from student's perspective within a teaching dental institute. Identification of these areas can provide prosthodontic dental educators, a road map for quality enhancement, curriculum revision and escalate student's contentment with the learning environment in dental institution.

### KEYWORDS

Prosthodontics, education, dental, surveys and questionnaires, students

### INTRODUCTION

Dental education is a challenging and stressful curriculum which enables students to acquire academic, clinical and interpersonal skills within a stipulated time frame. Changes in demographics, advances in biological sciences, fundamental changes in healthcare delivery systems and modern economy are forcing the dental educators to question the appropriateness of dental curriculum. Also, discouraging factors such as inefficient teaching strategies, student partiality, lack of information, non-conducive learning atmosphere and poor social interactions among teachers and students can drastically affect the dental students psychologically.<sup>1,2</sup>

Researchers have revealed symptoms like mild anxiety, inability to concentrate, reduced performance, depression and other debilitating effects indicating heightened stress among dental students. "Climate studies" conducted by Till et al.<sup>3</sup> have documented incongruity between reality and what students expect out of their learning environment.<sup>1</sup> Globally, various studies have documented that there is dissatisfaction among dental students in relation to their overall experience in dental schools.<sup>4,8</sup> It is imperative that the institutes should be assessed on a regular basis to identify areas of concern, guide strategic planning, focus on optimum resource utilization and nurture areas of excellence.

Studies have documented that subject of prosthodontics is elaborative, challenging and difficult to conceptualize while co-relating theoretical and clinical aspects. This has been attributed to paucity of patient exposure clinically along with traditional methodology of teaching thereby leading to difficulty in understanding the subject.<sup>5</sup> Also, the literature suggests that the transition period from preclinical to clinical situation is highly stressful and it still poses a great challenge for educators.<sup>6</sup>

In this regard, it is imperative to consider student's perception in relation to proficiency and reliability of teaching patterns and professional enlightenment. Identification of such valuable inputs from the dental students' mindset can provide prosthodontic educationists with a blueprint for quality enhancement and curriculum revision.<sup>9</sup> Various studies conducted in the past have taken the perspective of faculty, practitioners, alumni and professional organizations. However, very few studies have been reported regarding the view of dental students about the future of dental education. Therefore the present study was conducted to evaluate and compare the differences in the perception of the prosthodontic learning environment between the a) dental graduates and post graduate students, and b) preclinical years and clinical years of undergraduate curriculum in a dental teaching institute, Moradabad, India.

### MATERIALS AND METHODS

A questionnaire based survey was carried out in a dental college of Moradabad, Uttar Pradesh, India. Ethical clearance was obtained from the Institutional Committee of Ethics and Review Board (IERB No. 01/2018/10). A total number of two groups (all the undergraduates including interns and the postgraduates of the department of Prosthodontics and Crown and Bridge) were employed in the study. Informed consent was taken from the students. Also, the purpose of the study was explained to them.

A pre-validated and pretested questionnaire called as Dental College Learning Environment Survey (DCLES), proposed by Henzi et al.<sup>9</sup> was used to collect data related to educational environment from the study sample. The DCLES is one of three components of Students' Perspective Project (SPP), a study funded by the Council of Sections Project Pool of the American Dental Education Association.<sup>9</sup> The original questionnaire consisted of fifty five items to which five items specific to the

prosthodontic department were added (Fig.1). The sixty items were categorized under one of the seven subscales (Table 1). For each DCLES item, the subjects responded using a four-point likert scale: 0, strongly disagree; 1, disagree; 2, agree; and 3, strongly agree.<sup>10</sup> Initially, a pilot study was conducted on fifteen students to find out the expediency and utility of the questionnaire employed for the study sample.

No	Items
1	Faculty tries out new teaching methods and materials.
2	Students are able to shape their academic program to fit their individual needs and preferences.
3	A background in the behavioral sciences is seen as important in the development of a dentist.
4	Instructors outline course objectives at the beginning of their courses.
5	The educational experience makes students feel depressed.
6	The emphasis given to a particular content area on an exam is in proportion to the emphasis given to that content in the course.
7	Students in the college are distant with each other.
8	Faculty emphasizes the personal as well as the technical aspects of health care.
9	Students feel that they are learning what they need to learn in order to become competent dentists.
10	Classes progress systematically from week to week.
11	Faculties are reserved and distant with students.
12	Exams emphasize understanding of concepts rather than memorization of facts.
13	Students hesitate to express their opinions and ideas to the faculty.
14	Syllabus is vague and unclear.
15	Students in the college get to know each other well.
16	The environment of the college allows for interests outside of dentistry.
17	The educational experience tends to make students feel a sense of achievement.
18	Curricular and administrative policies are inflexible.
19	Students are called upon to actively put methods and ideas to use in new situations.
20	Faculty and administrators give personal help to students having academic difficulty.
21	Instructors explain what students should get out of their courses, and why the material is important.
22	Students gather together in informal activities.
23	The educational experience makes students feel frustrated.
24	The relationship between basic science and clinical material is not clear.
25	Students have difficulty integrating course material into a cohesive whole.
26	Student complaints are responded to with meaningful action.
27	Students' anxiety hinders them from achieving up to their full potential.
28	Faculty exhibit enthusiasm for the subject matter of their special field.
29	The college takes an interest in the personal welfare of the students.
30	Assignments (work allotment) are given out well in advance so students can plan their time accordingly.
31	Students spend time assisting each other.
32	Faculty tries to get students interested in the broad social context of oral health care.
33	Students talk about leaving college.
34	Students have difficulty finding time for family and friends.
35	Courses emphasize memorization of minute details.
36	When giving criticism or answering a question, faculty are genuinely interested in helping the student.
37	Students can see the relationship between what they are studying and the kinds of patient care situations they will meet when they graduate.
38	Students are so preoccupied with their studies that they lack time for recreation.
39	Students participate in decisions that affect their academic life at the college.
40	Courses emphasize the interdependence of facts, concepts, and principles.
41	Students are uncomfortable around the faculty.
42	Students are uncertain as to what will be expected of them on examinations.
43	Competition for marks is intense.
44	Courses develop skills in formulating and testing hypotheses, and drawing conclusions.
45	Courses are dull and tedious.
46	The educational experience makes students feel anxious.
47	Faculty is helpful to students seeking advice not directly related to academic matters.
48	There are tensions among students that interfere with learning.
49	Faculty regards their teaching responsibilities as a burden.
50	The educational experience makes students value themselves.
51	Examinations provide a fair measure of student achievement.
52	Students are reluctant to share with each other problems they are having.
53	Faculty encourages an understanding of the psychological aspects of patients when they visit the dentist due to oral disease.
54	There is lack of consistency between stated course objectives and what is actually taught.
55	The educational experience tends to make students feel confident of their academic abilities.
56	Students are able to correlate the work done between preclinical to clinical scenarios.
57	Students find understanding the actual patient situation in the preclinical laboratory before entering the clinics difficult.
58	Laboratory work is cumbersome and time consuming.
59	Multiple appointments with the patient helps to understand the psychology of the patient in a better way in prosthodontics compared to other departments.
60	Prosthetic work helps to develop artistic skills.

\*Maximum 4, minimum 0.

**Figure 1: Dental College Learning Environment Survey (DCLES) questionnaire**

**Table 1: DCLES category and its item number used for assessment of prosthodontic learning environment**

Dcles Variable	Category	Items Within Category	No. Of Items
Flexibility	Opportunities for faculty and students to modify the learning environment.	1,2,16,18,30,39	6
Student to Student interaction	Extent to which students mix socially and academically	7,15,22,31,48,52	6
Emotional Climate	The way in which students experience affects their perception of dental education	5,23,27,33,41,43,46,50	8
Supportiveness	Degree of concern expressed & support provided by faculty for students	11,13,20,26,28,29,36,47,49	9
Meaningful Experience	Extent to which structured learning activities are perceived to be relevant to the practice of dentistry	9,12,17,19,24,35,37,40,45,55,56,57,58,59,60	15
Organization	Degree of coherence of educational experiences within the curriculum	4,6,10,14,21,25,42,51,54	9

Breadth Of Interest	Extent to which student are encouraged to develop a variety of activities within & outside regular coursework	3,8,32,34,38,44,53	7
Total			60

A total of three hundred and thirty seven students (out of four hundred) participated and completed the survey. Students who were absent on the day of data collection were excluded from the study. The data obtained was statistically analyzed using statistical software SPSS (version 20.0) and Microsoft Excel (version 5.00). Student's independent t-test was employed to compare perception of prosthodontic learning among various groups. Higher score indicated a positive learning environment and lower score indicated a negative learning environment.<sup>9</sup>

**RESULTS**

Of the seven DCLES scales, the highest mean scores were for emotional climate (3.61±0.75) followed by breadth of interest (3.48±0.53). On the contrary supportiveness (2.68±0.72) followed by flexibility (2.77±0.67) showed lesser scores.

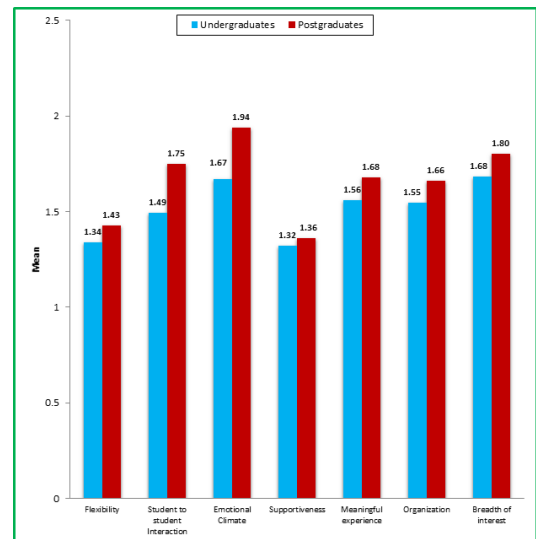
Also, when perception of the prosthodontic learning environment was compared between undergraduates and postgraduates (Table 2, Fig 2), statistically significant differences were found between student to student interaction (p<0.05) and emotional climate (p<0.05).

When compared between preclinical and clinical students (Table 3, Fig. 3), all the DCLES variables were statistically significant except student to student interaction (p>0.05) and emotional climate (p>0.05).

**Table 2: Comparison based on perception of the prosthodontic learning environment between the undergraduates and postgraduate students**

DCLES Category	Undergraduates		Postgraduates		p-value
	Mean	SD	Mean	SD	
Flexibility	1.34	0.43	1.43	0.24	0.417
Student to student Interaction	1.49	0.42	1.75	0.38	0.016*
Emotional Climate	1.67	0.44	1.94	0.31	0.017*
Supportiveness	1.32	0.37	1.36	0.35	0.663
Meaningful experience	1.56	0.34	1.68	0.24	0.159
Organization	1.55	0.36	1.66	0.26	0.218
Breadth of interest	1.68	0.32	1.80	0.21	0.132

\*Statistically Significant Difference (p-value<0.05)

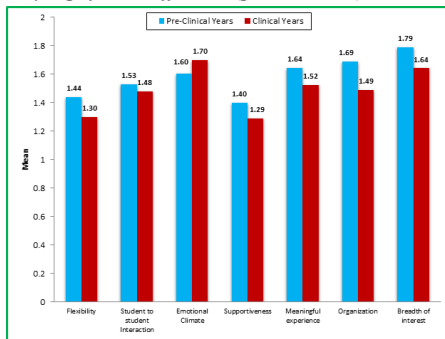


**FIGURE 2: Comparison of means of DCLES variable based on perception of prosthodontic learning environment between undergraduates and postgraduate students.**

**Table 3: Comparison based on perception of prosthodontic learning environment in Pre-clinical years and clinical years**

DCLES Category	Pre-Clinical Years		Clinical Years		p-value
	Mean	SD	Mean	SD	
Flexibility	1.44	0.43	1.30	0.43	0.009*
Student to student Interaction	1.53	0.41	1.48	0.42	0.335
Emotional Climate	1.60	0.38	1.70	0.45	0.069
Supportiveness	1.40	0.38	1.29	0.36	0.021*
Meaningful experience	1.64	0.34	1.52	0.34	0.005*
Organization	1.69	0.38	1.49	0.34	<0.001*
Breadth of interest	1.79	0.32	1.64	0.31	<0.001*

\*Statistically Significant Difference (p-value<0.05)



**FIGURE 3: Comparison of means of DCLES variable based on perception of prosthodontic learning environment between preclinical and clinical years.**

**DISCUSSION**

An ideal learning environment should groom students in such a way that they are competent enough to handle clinical cases, maintain professional ethics and also be able to manage stress levels in their day to day clinical practice. As institutional learning environment greatly influences student's performance and accomplishments after finishing dental school, it is imperative to know about student's experiences in dental institution.<sup>2</sup>

A number of surveys like Classroom Environment Scale, Learning Environment Inventory and College and University Environment Inventory have been developed for such purpose.<sup>9</sup> However, they did not give useful feedback to specific departments for evaluation at the degree or program level. Also, very few studies have employed qualitative methods to examine students' experience of dental education. The present study employed DCLES questionnaire for evaluating differences in the perception of the prosthodontic learning environment amongst graduates and prosthodontic postgraduate students, in a dental teaching institute, in Moradabad, India. The DCLES has been originally developed from an identical tool Medical School Learning Environment Survey (MSLES) with similar subscales except for the interchange of “dentistry” with “medicine” and “dentist” with “physician.”The questionnaire encompasses seven categories (flexibility, student-to-student interaction, emotional climate, supportiveness, meaningful experience, organization, breadth of interest) for recognition of positive and negative aspects within dental institute from the students' viewpoint and providing management with a roadmap for amendment and betterment.<sup>9</sup>

The results of the present study revealed that statistically significant differences were found in student to student interaction and emotional climate when perception of learning environment was compared between undergraduate and postgraduate students. However, the results were statistically insignificant for the remaining categories.

Student to student interaction illustrates social and academic interaction amongst students (i.e. if students perceive close relationships among their classmates).<sup>4</sup> Dental students should know the importance of effective team work and communication skills with their professional colleagues and patients. This would preclude professional or personal desolation to which dental practice may be pre-disposed. The higher end of the scale represents extrovert nature and friendly cooperation and the lower end signifies introvert nature

and estrangement. In the present study, a lower score amongst undergraduates in comparison to post graduates indicated lack of student participation and interest in the traditional didactic lectures where large group of students are involved leading to lack of inter-student interaction.<sup>10</sup> Therefore, clinical seminars and active group discussions in smaller groups would be preferred for enhanced understanding and learning. This will facilitate better communication among students owing to increased interaction.<sup>5</sup> Moreover, undergraduate students should be exposed to research work in order to hone their skills related to problem-solving and working effectively as a team.<sup>1</sup>

Emotional climate is identified as the student's affective response to their experience within the course.<sup>4</sup> A high score in the emotional climate represents less perceived stress and better management of emotions evoked by the demands of dental training. Whereas a low score depicts changes in the student's pattern of coping stress due to factors such as insufficient time, inadequate clinical faculty, compromised faculty-student relations and financial constraints. In the present study, a lower score among undergraduate students, as compared to post-graduate students indicated that students may find the burden of academic, laboratory and clinical work in various department stressful and may develop a perception that post-graduation phase would be more stressful in spite of sufficient clinical exposure and training.<sup>4</sup> Likewise in undergraduate curriculum, the transition period between preclinical and clinical phases setup is very challenging and stressful for the student. The results obtained are in accordance to the study conducted by Henzi et al.<sup>7</sup> Therefore, dental educators should identify the areas of undergraduate curriculum which are problematic for students. By addressing these issues, development of antagonistic behavior that may affect student's attitude at a later stage of professional life can be negated. A more successful adjustment to dentistry may be facilitated by improving the orientation content by overcoming challenges that are faced by the students. Involving the students in early clinical exposure, self-assessment opportunities, extra-curricular activities and research involvement is a great incentive for self-directed learning and to cultivate critical attitudes. Special consideration for the well-being of the students in terms of overall workload (hours spent in school and studying or preparing for the exam) like collaboration with university student counselling and psychological service providers would provide additional expertise in this field. Students should be engaged as an active participant in the decision making process to influence or change things in the course of their studies that will contribute to alleviate stress. Rather than being feeling alienated from the educational process, they must feel 'in control' and an integral part of the learning process.<sup>1,2</sup>

When students of preclinical and clinical years of undergraduate curriculum were compared, statistically significant difference was found in flexibility, supportiveness, meaningful experience, organization and breadth of interest. However, no statistically significant difference was found in student to student interaction and emotional climate.

The flexibility measures the extent to which students perceive the dental education as being open-ended and adaptable to provide opportunities for students to modify the learning environment. In the present study, the low score for clinical years signifies lack of freedom between students to modify and transform the learning environment according to their own need and preferences. Also, it indicates a constrained scope for faculty members to alter the learning environment as educational strategies and protocol are often formulated by higher authorities.<sup>7</sup> Students are included among the transformative agents and their participation should be encouraged in the decision making process of the school. The students should effectively utilize all the available sources to broaden their horizons including international exchange and visits, active participation in student organizations and congresses.<sup>1</sup>

Faculty supportiveness relates to approachability, guidance and concern expressed by the faculty towards the students. The faculty should be empathetic and enthusiastic so that students learning and motivation can be improved. In the present study, the low scores for clinical years suggested that the students were dissatisfied to an extent with the faculty's concern and support. To encourage students, faculty should willing to clear students doubts, able to provide sound guidance and have more approachability.<sup>7</sup> The dental teaching faculty should be formally trained (seminars, continuing education courses) on educational or pedagogic aspects, and should have a humanistic



approach with the undergraduate and postgraduate students.<sup>1</sup>

Meaningful experience addresses the degree to which students can actively correlate concepts taught during preclinical phase with the clinical training phase.<sup>4</sup> A higher score indicates that students are adequately trained by the faculty to ease the transition from preclinical to clinical situations. In the present study, a lower score for clinical years in comparison to the pre-clinical years indicated that students were unable to correlate preclinical work to clinical situations. It was also observed that students who performed academically well, struggled to manage the patients clinically and simultaneously cope up with laboratory work. Therefore, early clinical exposure to the preclinical students might help them in positive correlation of theoretical and practical aspects.<sup>6</sup> A student can be trained to develop artistic skills by doing an exercise repeatedly. For effective learning experience, the pre-clinical students should be allowed to observe and assist clinical work done by senior students. The approachability, enthusiasm, commitment and willingness of the instructor towards the students to give guidance and feedback can contribute to effective learning experience.<sup>12</sup>

Organization is the degree of coherence of educational experience within the curriculum. This scale distinguishes between organized, purposeful planned activity and uncoordinated, disorganized, diffused activity. For example – students are able to organize course material into cohesive whole / students may find it difficult in co-relating subjects of previous year with those of the next year.<sup>4</sup> In the present study, a lower score for clinical years depicted a moderately negative perspective towards dental education. It is important that knowledge imparted in dental institution is positively co-related with the skills necessary to be developed for dental practice. This would lead to positive perception amongst students towards dental education.

Breadth of interest implies if faculty actively engages and addresses extra-curricular activities. The higher score interprets that the dental faculty motivates students to engage in allied activities such as exchange programs. In the present study, the low score for clinical years indicated students usually adopt 'conductive strategies', conform themselves by becoming submissive learners and are discouraged from becoming critical thinkers or life-long learners. It was revealed that undergraduates, throughout their course, anticipated dental school as a seldom-to-occasionally positive learning environment. The module of the educational program must be delivered in an innovative manner involving different methods to suit students with divergent learning styles and capacities. A positive academic environment should procure resources for dental students to effectively use all available means to widen their horizons including: international exchanges and visits, participation in congresses, active involvement in student organizations, research projects and electives and volunteer activities in local communities.<sup>1</sup>

The results of the present study highlights the importance of getting regular feedback from students related to their experiences about the educational environment since it strongly affects student's accomplishments and contentment. Focus should be on overall enrichment of the students rather than submissive and mechanical teaching methods. The students should be nurtured to build a strong foundation and prepare them to face professional and practical challenges ahead. Keeping into consideration the feedback analysis of students, short term and long term strategies should be planned and accordingly, corrective measures should be taken for betterment of overall quality of the educational environment.

However, the present study has certain limitations. As the study included only one teaching institute and the response rate was 84%, the findings of the present study cannot be generalized to other dental institutes in India and globally. Therefore, further multi-center studies in different geographical areas should be conducted to provide a better insight about positive and negative attributes of the learning environment prevalent in dental institutes.

## CONCLUSIONS

Within the limitation of the study, areas of strength and weaknesses within a teaching dental institute have been identified from the student's perception. It is imperative to perceive that education is more than knowledge procurement or training. Evaluative techniques should be formulated in a manner that escalates students' self-assessment capability and promote self-directed learning. Analysis of

the needful areas of dental students can help the dental educators and management of the institutions to make necessary ramifications in order to enhance student satisfaction with the learning environment of the dental institute enrich the overall dental education experience.

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