

## Evaluation of prosthodontics practical teaching by dental students

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### Abstract

**Introduction:** Student assessment is an effective tool for improving teaching performance. The purpose of this study was to analyze the prosthodontics practical teaching assessment by students of the Institute of Odontology and Stomatology in Cheikh Anta Diop University.

**Materials and Methods:** This was a descriptive and cross-sectional study carried out among 103 students in Master 1 and Master 2 in dentistry. The variables observed included student supervision, preclinical work and evaluation of practical prosthodontics learning. The Likert scale graduated from 1 to 5 allowed a quantitative assessment. SPSS® software version 17.0 was used for statistical analysis. The comparison of averages used Student t-test. The risk of error has been set at 5%.

**Results:** The majority of students (65.1%) found the number of teachers insufficient. Learning objectives were stated for 60.2% of the sample and evaluation procedures were specified for 41.7%. For 73.8% of students, a demonstration was made at each session. The video projector was used according to 69.9% of students. Concerning the certification evaluation, 66% of them disagreed with the final single formula.

**Conclusion :** Given the limitations observed in student assessment, an evaluation of its effectiveness would improve teaching performance.

**Keywords:** Prosthodontics, Practical teaching, Students, Assessment.

### Introduction

The Student Assessment of Education is designed to identify and analyse the strengths and weaknesses of an education with a view to improve its performance. In the United States, it is an effective instrument for collecting students' opinions about the quality of teaching, while in Europe, ownership of the evaluation approach remains a difficult process.<sup>1-5</sup>

African universities in the south of Sahara have not remained on the sidelines of this global trend to promote the quality of education. The Faculty of Medicine, Pharmacy and Odontology of Cheikh Anta Diop University has undertaken a series of pedagogical and structural reforms as part of an overall quality approach.<sup>6</sup> At the Institute of Odontology and Stomatology, the Student Assessment of Education process is initiated with the evaluation of prosthodontics teaching.

This study aimed to analyse the prosthodontics practical teaching assessment by students of the Institute of Odontology and Stomatology in Cheikh Anta Diop University.

### Materials and Methods

This was a descriptive and cross-sectional study at the Institute of Odontology and Stomatology of Cheikh Anta Diop University in Dakar. The selection of the sample was made after an exhaustive recruitment among the 120 students in Master 1 and Master 2. The study included consenting volunteer students enrolled in 2011-2012. The variables observed were related to socio-demographic data (age, sex, grade) and items related to the supervision, practical work and evaluation of the prosthodontics practical training during dental studies. Practical training was

provided by 6 assistant professors in the Prosthodontics Department. The time credit is 3 hours per session, i.e. 96 hours in Licence 2 and 156 hours in Licence 3. The self-administered questionnaire is a synthesis of the evaluation questionnaire templates from a literature review.<sup>7-9</sup> It was improved after the pre-test on a sample of 10 randomly selected Master 2 students. The students concerned had received the necessary explanations to understand the different items.

The quantitative evaluation used the Likert scale<sup>10,11</sup> graduated from 1 to 5. Each student had to assign to the items a score corresponding to the degree of agreement that could belong to one of the 3 categories specified by "Disagree", "Neutral" and "Agreement". The quantitative variables were described by their mean and standard deviation. The assessments were expressed in number and percentage in an evaluation report. The SPSS® software version 17.0 for Windows was used for statistical analysis. A Principal Component Factorial Analysis with Varimax rotation was implemented to evaluate the structure underlying the items. The items in the domains had to have a factor load greater than 0.35 to be considered relevant for the evaluation of prosthodontics practical teaching. The psychometric analysis of the questionnaire to look for internal consistency of the items used Cronbach's  $\alpha$  coefficient which varies between 0 and 1 and which is all the greater as the items are correlated with each other. A coefficient of 1 corresponded to a redundancy of items in the domain studied and a coefficient of 0 meant an absence of consistency. The internal consistency of a dimension was good if the coefficient was greater than 0.6.<sup>11</sup> The Student t-test was used for comparison of age averages by gender. The significance level was set at 5%.

**Results**

Among the 120 students enrolled, 103 completed the questionnaire, i.e. a response rate of 85.8%. The response rate was 68% in Master 1 and 98.6% in Master 2.

Male students accounted for 54.4%, i.e. a sex-ratio of 1.2. The average age was  $26.6 \pm 2.2$  years with a maximum of 33 years and a minimum of 23 years. The average age was significantly higher for men than for women ( $p = 0.01$ ), with  $27.3 \pm 1.9$  years and  $25.8 \pm 2.3$  years respectively. (Table 1) In the sample, Master 2 students accounted for 66.9% of the total. Women accounted for 61.8% in Master 1 and 37.7% in Master 2. (Table 2)

The items used had a factor load greater than 0.35. (Table 3) The psychometric analysis of the internal consistency of the items assigned to the "Practical Work"

domain a Cronbach's  $\alpha$  coefficient of 0.64 with an average of  $3.41 \pm 0.3$ . (Table 4)

The majority of students (65.1%) found the number of teachers supervising the practical work sessions insufficient. Teachers were available according to 46.6% of the sample. The learning objectives were defined at the beginning of the session according to 60.2% of the students and the evaluation procedures specified according to 41.7% of the sample. For 73.8% of them, a demonstration was made by the teachers at each session. The briefing relating to the practical work session was presented using a video projector according to 69.9% of the students. About the certified learning assessment, 73.8% of them disapproved of the final single formula. (Table 5)

**Table 1. Age and gender distribution**

Gender	Age (years)				P-value
	Mean	Standard deviation	Minimum	Maximum	
Male (n = 56)	27.3	1.9	23	31	0.01
Female (n = 47)	25.8	2.3	23	33	
Total	26.6	2.2	23	33	

**Table 2. Distribution by gender and academic level**

Gender	Academic level				Total	
	Master 1		Master 2		n	%
	n	%	n	%		
Male	13	38.2	43	62.3	56	54.4
Female	21	61.8	26	37.7	47	45.6
Total	34	33.1	69	66.9	103	100

**Table 3. Relevance factor analysis of evaluation items**

Pedagogical area	Items of Assessment	Factor load
Supervising rate	The number of teachers is sufficient	0.568
	Teachers are available in practical work	0.395
Practical work	Objectives are defined at each session	0.606
	Valuation procedures are specified	0.548
	A demonstration is made at each session	0.397
	Teachers use the video projector	0.397
Certificative evaluation	The single evaluation is a good formula	0.570

**Table 4. Psychometric analysis of assessment areas**

Pedagogical area	Mean $\pm$ standard deviation	Cronbach's coefficient $\alpha$
Supervising rate	$2.28 \pm 0.41$	0.7
Practical work	$3.41 \pm 0.3$	0.64
Certificative evaluation	$2.6 \pm 0.52$	0.56

**Table 5. Evaluation report on prosthodontics practical teaching**

Pedagogical area	Clinical Evaluation Items	Assessment		
		Agree	Neutral	Disagree
		n (%)	n (%)	n (%)
Supervising rate	The number of teachers is sufficient	26 (25,2)	10 (9,7)	67 (65,1)
	Teachers are available in practical work	48 (46,6)	20 (19,4)	35 (33,9)
Practical work	Objectives are defined at each session	62 (60,2)	12 (11,7)	29 (28,2)
	Valuation procedures are specified	43 (41,7)	20 (19,4)	40 (38,9)
	A demonstration is made at each session	66 (73,8)	11 (10,7)	16 (25,5)
	Teachers use the video projector	72 (69,9)	11 (10,7)	20 (19,4)
Certificative evaluation	The single evaluation is a good formula	22 (21,3)	5 (4,9)	76 (73,8)

## Discussion

The selected items are relevant to evaluate prosthodontics practical teaching when their factor load is above 0.35.<sup>11-13</sup> The items making up the pedagogical field of supervision have a better internal coherence than the items of practical work. As for the items in the learning assessment, their low internal consistency calls into question the performance of the assessment made by students.<sup>11</sup> It then seems necessary to reinforce the internal coherence of the items composing the pedagogical domains by consulting teachers or organizing focus groups with students. Similarly, the administration of the questionnaire in several stages would help to identify pedagogical areas with a high degree of internal consistency.<sup>11,14</sup>

The sample is characterized by a male predominance. The results do not reflect the global trend towards the feminization of dental studies.<sup>15</sup> This difference is related to the fact that the survey was carried out among students at the end of their training, while other studies on the same subject concerned all students in the entire dental cycle.<sup>12</sup>

Most students feel that the number of teachers is insufficient and less than half of the sample find them available during the practical work sessions. It appears that the supervision rate for practical education is deficient, which is confirmed by the allocation of the lowest average. The unsuitability of the supervision ratio is linked to the fact that it is the same team that ensures from the 2<sup>nd</sup> to the 6<sup>th</sup> year of study, in addition to the practical work, the lectures, the clinical teaching, as well as the direction of the research work. Their high workload considerably reduces their availability. To carry out a comprehensive evaluation of teaching, it would be more appropriate to carry out a critical analysis taking into account all the other dimensions and pedagogical and research activities of teaching staff.

The majority of students say they are aware of the learning objectives. Similarly, Abraham<sup>16</sup> reported that 96% of medical students felt that the objectives of the practical work were well stated. In addition, more than 2 out of 3 students report that teachers use a video projector and perform a demonstration to prepare for the practical work session. The use of the docimological approach and adapted didactic tools constitutes a pedagogical process conducive to better practical learning and effective preparation for its evaluation.

The certification evaluation is not well appreciated by the students who gave it a low average. Most of them disagree with the final single assessment. Given the recommendation to use reliable instruments for the learning assessment process<sup>17</sup>, it is important to focus on a method of assessment through continuous monitoring.

## Conclusion

The management of student assessment is part of the overall process of improving and regulating higher education. Given the limitations observed in the evaluation of prosthodontics practical teaching by students, an

assessment of its effectiveness would make it possible to take political decisions in favour of effective teaching.

**Conflict of Interest:** None.

## References

1. Curtis DA, Lind SL, Brear S, Finzen FC. The Correlation of Student Performance in Preclinical and Clinical Prosthodontic Assessments. *J Dent Educ* 2007;71(3):365-372.
2. Jahangiri L, Mucciolo TW. Characteristics of Effective Classroom Teachers as Identified by Students and Professionals: A Qualitative Study. *J Dent Educ* 2008;72(4):484-93.
3. Younes N, Romainville M. Current transformations in student assessment of teaching. *Mesure et évaluation en éducation* 2012;35(3):177-201.
4. Gerzina TM, McLean T, Fairley J. Dental Clinical Teaching: Perceptions of Students and Teachers. *J Dent Educ* 2005;69(12):1377-1384.
5. Schönwetter DJ, Lavigne S, Mazurat R, Nazarko O. Students' Perceptions of Effective Classroom and Clinical Teaching in Dental and Dental Hygiene Education. *J Dent Educ* 2006;70(6):624-635.
6. Sall CT. To know the teachers' perceptions about the evaluation of lessons, a step in the process of implementing a quality approach. In: Romainville M, Coggi C. Students Assessment of Education. 1st ed. Brussels: De Boeck 2009.
7. Spoor P. On the credibility of the judge. A cross-classified multilevel analysis on students' evaluation of teaching. *Stud Educ Eval* 2010;36(3):121-131.
8. Gerekan B. Student Evaluations of Teaching Factors in Accounting Education: An Empirical Study at a Turkish University. *Eur J Social Sci* 2011;3(23):410-416.
9. Davies B, Leung A, Dunne S. So how do you see our teaching? Some observations received from past and present students at the Maurice Wohl Dental Centre. *Eur J Dent Educ* 2006;10(4):236-241.
10. Joshi A, Kale S, Chandel S, Pal DK. Likert Scale: Explored and Explained. *Br J Appl Sci Technol* 2015;7(4):396-403.
11. Dancy C, Reidy J. Statistics Without Maths for Psychology. 7<sup>th</sup> ed. London : Pearson United Kingdom, 2017.
12. Hammond SM, O'Rourke M, Kelly M, Bennett D, O'Flynn SA. Psychometric appraisal of the DREEM. *BMC Med Educ* 2012;12:2-5.
13. Ostapczuk MS, Hugger A, de Bruin J, Ritz S, Rotthoff T. DREEM on, dentists! Students' perceptions of the educational environment in a German dental school as measured by the Dundee Ready Education Environment Measure. *Eur J Dent Educ* 2012;16:67-77.
14. Nasser-Abu AF, Fresko B. Student evaluation of instruction: What can be learned from students' written comments? *Stud Educ Eval* 2009;35:37-44.
15. Ndiaye L. Analysis of the factors influencing the choice of dental studies: study among students in training in Dakar. *Thesis Chir Dent, Dakar* 2010, 23.
16. Abraham R, Ramnarayan K, Vinod P, Torke S. Students' perceptions of learning environment in an Indian medical school. *BMC Med Educ* 2008; (8):20-25.
17. Berthiaume D, Lanarès J, Jacqmot C, Winer L, Rochat JM. [Evaluation of teaching by students]. *Recherche et formation* 2011;67:53-72.

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