

**SELF ASSESSMENT OF DENTAL STUDENTS AS LEARNING MODALITY  
IN PRECLINICAL DENTAL EDUCATION**

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## ***SELF ASSESSMENT OF DENTAL STUDENTS AS LEARNING MODALITY IN PRECLINICAL DENTAL EDUCATION***

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### **Abstract:**

The goal of dental education is to prepare future clinicians for a general dental practice. The curriculum delivery utilizes learning methodology that includes lectures, pre-clinical laboratories, problem-based learning and clinical internships.

The aim of our study was to show whether dental students were able to critically evaluate their work and whether their abilities to self-assess would improve over the study.

The study examined whether there was a positive correlation between student self-evaluation scores and instructor scores in the second year of Preclinical Cariology and Prophylaxis of oral diseases, courses at the Dental Medicine, Faculty of Medical Sciences, at the University "Goce Delcev", Stip.

The results concerning self-evaluation among second year dental students in preclinical procedures, who rated themselves regularly throughout the course of the year, exhibited some expected outcomes.

The Criteria-based Self- Evaluation sheets provided the students with an orderly and systematic approach to evaluating their preclinical work.

**Key words:** dental education, assessment, self-evaluation

## INTRODUCTION

The dental school curriculum places significant emphasis on the acquisition of technical skills resulting at the end of dental training in a competent dentist. The goal of dental education is to prepare future clinicians for a general dental practice. The curriculum delivery utilizes learning methodology that includes lectures, working in pre-clinical laboratories, problem-based learning, clinical internships and externships.

Students become familiar with didactic approach based on the lectures and the “signing off” of student work. (1) To shift from the didactic approach to more of a problem-centered approach involving independent learning, self-assessment and reflection is difficult for students to do.

Development of these skills is also critical for graduates to be able to manage the change in dental practice environment by being effective life-long learners. (2) In particular, they need to be accurate and effective self-assessors and be able to address their learning needs. (3) Main goal of professional higher education is to help students develop into practitioners able to reflect critically upon their own professional practice. Students in modern organizations must be able to analyze information, to improve their problem-solving skills and communication, and to reflect on their own role in the learning process. (4) Students do not always have the opportunity to reflect on their learning, make connections to basic science information, recall the knowledge that they already have, and to employ problem-solving strategies for patients under their care. (5)

Undergraduate dental education aims to produce safe, competent and ethical practitioners equipped with the necessary knowledge, skills and behaviors (attitudes). All of these attributes have to be appropriate to engage in the independent practice of dentistry. All assessment procedures should be adequate in time, meaningful, transparent and appropriate. They should be based upon the learning outcomes of the individual program / course, so that academic and clinical student activity is directed towards those desirable outcomes. All dental schools should be encouraged to clearly present the

purposes and processes associated with their assessments so that students and staff are fully informed. (6)

Self-assessment as an educational modality has been used in various health professional programs as a means to ensure competence.(7,8) Throughout one's professional career, health professionals must continually assess their knowledge base, skills and performance and most importantly, act upon these assessments.(9)

Effective learning that involves two key elements: to understand the given standards and criteria, and the ability to accurately judge whether one's work meets the former. If both of these key elements are fulfilled, only then can evidence support that self-assessment methodology accelerates the learning of novices. (10)

Self-assessment is based on two very important underlying principles: self-reflections which firstly lead to deeper understanding, and collaborative assessment with instructors which leads to more accurate self-assessment. (11)

Self-assessment has been shown to increase the students' motivation to learn as well as shift the mindset from "how have I performed" to "how I can get better". (12) Students must be trained to critically evaluate their work through self-evaluation. There are noticeable positive correlations between pre-clinical performance and self-evaluation. (13)

From an instructor's point of view, discrepancies can serve as an educational diagnosis to problems within the student's abilities to self-assess and of course they can be used to improve the education. (14)

Aim of our pilot study was to show whether dental students were able to critically evaluate their work and whether their abilities to self-assess would improve over the study.

## **MATERIAL AND METHOD**

The study examined whether there was a positive correlation between student selfevaluation scores and instructor scores in the second year of two different courses - Preclinical Cariology and Prophylaxis of oral diseases, courses at the Dental Medicine, Faculty of Medical Sciences, at the University "Goce Delčev", Štip. Total number of thirty

six (36) students of Dental Medicine from the fourth semester in the academic 2013/2014 year participated in this study.

Criteria based evaluation forms were created for each of the operative dentistry procedures; preparation, restoration, and finishing with Amalgam procedures.

The skills that were assessed for the subject Prophylaxis of oral diseases included learning about the diagnostic methods and also therapeutic prophylactic recommendations for the patients.

After every exercise or seminar, each student was given a questionnaire that assessed their realization: preparations, restoration, finalizing, diagnostics and prophylaxis.

All of the above parameters were further analyzed and evaluated by an independent evaluator from Faculty of medical sciences, University Goce Delcev-Shtip, mainly by assistants from the group of doctoral students.

At the end of each practical examination, students were given ten minutes to complete the Criteria-based self-evaluation form and assign themselves a mark. One faculty member blindly evaluated and assigned a mark for the practical exercises using the same evaluation form without the knowledge of the students' self-evaluation.

The assessment of competencies was realized with attribute evaluating. Marks were awarded on a 1-4 scale based on mark guidelines within the marking rubric (Table 1).

Grade	SKILL LEVEL
4	Excellent or superior result
3	An acceptable or satisfactory result
2	An unacceptable result; significant modifications are required to achieve an acceptable result
1	An unacceptable result; Errors are not correctable by modification; procedure must be redone.

## RESULTS

From a total number of 36 students in the practical exercises for the subject Pre-clinical cariology, 24 of them or 61% had rated themselves with a grade of 4, 30% (or 11 students)

with acceptable satisfactorily, and one student or just 3% of subjects with a grade of 2. (Tab. 2)

Table 2- Self-evaluation of students for the subject pre-clinical cariology

Students n=36 competitions	Grade 4	Grade 3	Grade 2	Grade 1
Preparation Restavration Polishing	24 (67 %)	11 (30 %)	1 (3 %)	/

For the subject Prophylaxis of oral diseases, out of 36 students with practical teaching, 30 or 83% of them rated themselves with a grade of 4 i.e. great knowledge, and 17% or 6 students rated themselves with - acceptable satisfactorily. Grades of 1 or 2 were not recognized. (tab. 3)

Table 3 - self- assessments of students for the subject Prophylaxis of oral diseases

Students n=36 competitions	Grade 4	Grade 3	Grade 2	Grade 1
Diagnostic methods Prophylaxis	30 (83%)	6 (17%)	/	/

The assessment and analysis from the external evaluator for the subject Pre-clinical cariology showed that with a score of 4 were rated 22 students or 61%, while 31% or 11 students were rated with acceptable satisfactorily, and three students or 5.5% with a grade of 2( tab. 4)

Table 4 - External evaluation of students for the subject Pre-clinical cariology

Students n=36 competitions	Grade 4	Grade 3	Grade 2	Grade 1
Preparation Restavration Polishing	22 (61%)	11 (31 %)	3 ( 8 %)	/

External evaluation of practical teaching for subject Prophylaxis of oral diseases showed that from a total number of 36 students, 28 of them or 78% were rated with a grade 4, 19% of them or 7 students with an acceptable satisfactorily, and one or 3% of them with grade 2 (Tab. 5)

Table 5 - External evaluation of students for subject Prophylaxis of oral diseases

Students n=36 Competitions	Grade 4	Grade 3	Grade 2	Grade 1
Diagnostic methods Prophylaxis	28 (78%)	7 (19%)	1 (3%)	/

Table 6 - Comparison of self-evaluation and external evaluating for the subject Pre-clinical cariology

Students n=36 Pre-clinical cariology	Grade 4	Grade 3	Grade 2	Grade 1
Self-evaluation	24 (67 %)	11 (31%)	1 (2%)	/

External evaluating	22 (61%)	11 (31 %)	3 ( 8 %)	/
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Table 7 - Comparison of self-evaluation and external evaluating for the subject Prophylaxis of oral diseases

Students n=36 Prophylaxis of oral diseases	Grade 4	Grade 3	Grade 2	Grade 1
Self-evaluation	30 (83%)	6 (17%)	/	/
External evaluating	28 (78%)	7 (19%)	1 (3%)	/

The results concerning self-evaluation among second year dental students in preclinical procedures, who rated themselves regularly throughout the course of the year, exhibited some expected outcomes.

**DISCUSSION**

The overall feedback by the dental students regarding the value of the self-assessment skill in their dental training was favorable even though the students had not gone through any formal training on how to carry out self-assessment. (15) When evaluating the data to determine the relationship between examination scores and self-assessment results, we observed interesting trends that require looking beyond mean values of each group in order to carefully consider associations among individual student performance variables. (16)

When reviewing a clinical procedure completed by a student, the faculty will identify areas that could potentially be improved. We believe that students, who just like the faculty members, are able to recognize both their correct and incorrect actions in completing a clinical procedure, may be those with higher self-assessment scores. (17)

On one hand, we live in a society where mistakes are often perceived as a sign of weakness. Students naturally make mistakes during the process of learning. On the other hand, reflective learning exercises, such as self-assessment, require students to develop skills in recognizing, understanding, and learning from their mistakes. (18) Creating an environment in which students are encouraged to understand that their mistakes are an integral part of the educational process is a challenge, but it could also lead to improved self-assessment skills, which the current study suggests could result in improved learning. (19)

In our study it was found that students in the self-evaluation indicated that their tasks were performed with excellence. It refers to both examined objects: Pre-clinical cariology and Prophylaxis of oral diseases. 67 % from the students of Pre-clinical cariology, and 83% from the students of Prophylaxis of oral diseases, rated their work as excellent. There were no students who assessed their work as unsatisfactory.

After the external evaluation it was found that the majority of students in both subjects, and 61 % of those for the pre-clinical cariology, as well as 78 % of those for prophylaxis of oral diseases, were rated as excellent. No student of the two objects assessed the success of their work as unsatisfactory.

Therefore it is easily noticeable that there was no difference between the self-evaluation and external evaluation made for these two subjects. In the beginning stages during the first exercises, the self-evaluation and external evaluation were lower than the results received after few months of studying. As the time passed the motivation, skills and competences of the students increased, so the evaluation showed a grade of 4.

Successful instruction of novice dental learners requires understanding motor skills theory, motor performance, and implicit learning, as well as the schema of stages of learning. For novice students, explicit directions given in small steps and provision of

timely and appropriate feedback on performance are techniques that facilitate learning of motor skills. Repetition and continued practice improve performance. (20) Designing and applying appropriate evaluation instruments may contribute to effective teaching, calibration of faculty, and student learning. Rubrics and rating scales designed with specific criteria related to each step in a preclinical skill performance can be valuable tools for both the learner and the evaluator. Novice students benefit from criteria that are explicit and meaningful. Further study is needed to assess the impact of nontraditional grading systems for preclinical and clinical courses. (21)

Dental and dental hygiene programs across the country utilize self-assessment as one of the several components in evaluating pre-clinical and clinical skill development. (22) Instructor feedback and reinforcement are critical in helping students advance to the next stage of the learning continuum. (23)

## Conclusions

Self-evaluation is quite effective pedagogical activity, and as a methodology should be introduced in dentistry and other medical disciplines. In relation to the examination of when to start this procedure, we recommend it to be in the 4th semester, especially because, in preclinical subjects self-evaluation can increase the skills and competencies of students, and it can make them even more motivated to study further in the following years, and with bigger effect in teaching of different clinical content and subjects.

As a conclusion and recommendation, the system of self-evaluation should be introduced in dentistry in the second year because as such it enhances teaching education, motivation and competencies of the students ensuring that they would evolve in ready, willing successful clinicians.

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