INTRODUCTION

The ideal product of a competency-based curriculum is a dentist who is “transparently competent.”¹ Another definition of competence includes recognizing when a presenting condition exceeds one’s competence.² The above can obviously not be achieved unless the student has developed the ability to assess his own work accurately.

Traditionally, formative and summative assessments are carried out to judge whether the student has achieved certain educational objectives.³ The problem of summative assessments remains that this one point in time may not be the true representative of the student’s ability, it could be one lucky or unlucky attempt.¹ Continuing formative assessments have been recommended as increasing the clinical workload may not be the answer.

METHODOLOGY

Data were collected from the self analysis of ceramc crown preparations of 60 students of second year BDS out of 75. Because only three students were male, gender differences could not be calculated.

Ethical approval for the use of human subjects was received from the Ethical Review Committee of the Islamic International Dental College. Confidentiality regarding student identity was respected.

The pre-clinical operative dentistry curriculum of Second year BDS includes the preparation of all-ceramic crowns. Course delivery is by powerpoint presentation outlining the indications, contraindications and steps in preparation. This is followed by viewing a 19-minute video showing the procedure being completed stepwise.⁴ The video was stopped several times throughout to re-explain the procedure being shown, so the actual amount of time taken to view the video was about twice this time. The actual procedure was then demonstrated to the students by the preparation of a phantomhead tooth for an all-ceramic crown by the instructor. Students are then required to prepare a central incisor phantom head tooth themselves.

After completing their preparations, students were asked to evaluate themselves according to the ten points given on the checklist as shown in table 1. Each point on the checklist was given a mark out of ten.

Evaluations of each crown preparation were carried out by a single instructor. Three months later the same evaluations were carried out by the same instructor on ten teeth to check intraoperator variability by applying Cohen’s Kappa. This was calcu-

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lated to be 0.8 which is classified as substantial agreement().

1) Crown margin- does it follow the CEJ
2) Crown margin- Is it 1.5mm deep
3) Proximal taper- Is it correct?
4) Buccal reduction- Is it in two planes
5) Buccal reduction- Is it’s taper with the cingu-
   lum collar correct
6) Lingual reduction- Is the cingulum collar
   present
7) Lingual reduction- Is this concave coronal to
   the cingulum area
8) Incisal reduction- Is this correctly reduced by
   2mm
9) Absence of sharp corners and edges
10) Overall evaluation of your crown preparation

Table 1: Items evaluated by students and the
instructor.

Data Analysis

Data entry and analysis was carried out with the
help of SPSS 17. A Paired samples t-test was carried out
to see if the difference between self- and instructor
evaluations were statistically significant for each item
at a confidence interval of 95%. Pearson's correlation
coefficient was used to assess bivariate associations
between students self assessment and instructor as-
essment, again separately for each item.

RESULTS

A paired sample t-test was carried out to compare
the marks given by second year BDS students to
themselves when evaluating their own crown prepara-
tions to the evaluation by a senior teacher according to
a ten-point checklist.

For all ten items except item number 3, there was
a significant difference between evaluations conducted
by the instructor (mean= 2.47 to 7.48, standard devia-
tion= 1.40 to 2.94) and those conducted by students
(mean= 6.92 to 7.95, standard deviation = 1.33 to 1.88)
on their own crown preparations; t(59)=+3.98 to 11.2,
p= 0.000. (See table 3). For item 3, there was no
significant difference between evaluations conducted
by the senior teacher (M= 7.28, SD= 2.22) and those
conducted by the students on their own crown prepara-

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Table 3 shows the difference of the means of each pair of self and instructor evaluation, the standard deviations of these differences and their standard error of mean. In addition the t statistic, the degrees of freedom(df) and the significance is also given separately for each item.

A Pearson Correlation coefficient was calculated to find if any relationship, direct or inverse, existed between the score given by self-evaluation and the score given by the instructor (Table 2).

Pearson r values ranged from -0.09 for item 3 (poorly correlated) to 0.32 for item 1 (positively correlated).

There was a positive correlation between self and instructor scores for items 1 and 9, r= 0.32 and 0.29, n=60, p= 0.013 and 0.023 respectively.

For all other items (2-8 and 10), no statistically significant positive or negative correlation was found between self and instructor scores, r=0.23 to -0.09, n=60, p=0.084 to 0.85.

DISCUSSION

Summative or formative assessment can be done by global rating or checklist or rating scale. A ten-point rating scale was used for convenience and brevity. All checklists for restorative work serve as a guide and none can be comprehensive enough to cover all aspects of crown preparation without becoming long and tedious to fill. The problem with this approach, however is that we convert a qualitative assessment into a number out of ten. This can introduce a certain difficulty into the study. For example in item 2, which gives marks for the shoulder width, other measures of quality of margin preparation such as absence of unsupported enamel, too much or too little reduction, uniform width of the shoulder around the tooth, sharp corners at the line angles of the tooth, correct angulation at 90° and roughness or smoothness of the shoulder would also have to be taken into account when giving a final score. Nevertheless, this is a situation commonly confronted when grading preclinical work. Effectively, the checklist is converted into a ten-point global ratings scale.

Item 3 regarding proximal taper was one of the tasks which students performed very well. This implies a greater understanding of this particular step of crown preparation. The marks they assigned themselves were closest to the marks given by the instructor. This is also the only item on the checklist which did not have a statistically significantly difference of score between self and instructor evaluations, p value=0.39.

Steps most difficult to perform included those related to palatal reduction. This may be due to the fact that it has to be done by indirect vision and this is sometimes difficult to master.

Esser et al1 used a laser 3-D system to measure the anterior crown preparations of pre-clinical students and compared assessments done visually by five different faculty members. He found that convergence angle was highly correlated between the two methods and this study also found the same.

Ability to evaluate accurately your own work means that the course hours can be more efficiently utilized. Harvard has reduced the hours of it’s pre-clinical operative curriculum. Student perception of preparedness for the clinical phase was actually increased as a result.6

Some studies relate that self–evaluation cannot be a reliable tool to evaluate the performance of a student because the students who performed very well gave themselves less marks and those whose performance was not so good over-estimated their performance.7

In this study, only one examiner evaluated the crown preparations so this could be a weakness of this study, inter examiner reliability is a very real problem and continues even when using different measuring methods. This variability can be a source of stress for dental students.8

REFERENCES