



Initiating Learning through Innovative Technological Advances

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Abstract

Objective Our Objective is for the students to learn and enhance their preclinical performance on typodont teeth before they enter the clinics and start treating patients

Introduction New York University College of Dentistry (NYUCD) prides itself on giving its students access to advanced technological devices and methods that help nurture their learning from their pre-clinical simulation courses given in the second year preparing them as future dentists. Part of the Esthetics course is the preparation of inlays, onlays and anterior crowns. These procedures are most difficult to prepare, whether they are tooth colored or gold. Watching the DVD helps student to successfully challenge their goal. Lectures along with pictures posted in the Simulation laboratory, has always aided in teaching. Adding a video component (DVD) to the inlays and onlays portion of the course, has enabled students to learn the concepts visually easier and with more precision than traditional learning.

Method Second year students are required to attend the simulation lab and prepare indirect procedures on typodont teeth. They are mandated to observe the DVD of the given procedure (approximately 5-10 minutes) prior to attending that procedures session. A quiz is administered at the beginning of the session relating to the particular procedure they are performing that day. Then, the procedure is demonstrated once again electronically from the podium and seen on a monitor at each student's station. A printed Self Evaluation sheet is distributed to each student stating all grading criteria guidelines such as tapered walls, depth of the preparation and undercuts. While the student is preparing the given procedure on a typodont, he/she will utilize the digital camera (Quick Time) DVD with audio narration to virtually get guidance on the procedure as well as verbal feedback from their respective row instructors. The DVD video is repeated several times (looped) during the pre clinic lab session - approximately 2 hours.

Conclusion: Through continual advances in learning modalities such as prior viewing a DVD Quick Time audio narration posted on NYU Classes course web-page, student learning and performance has significantly improved and successfully challenge

1. Introduction

Dental students have traditionally been taught to attend lectures, read required text books, prepare plastic typodont teeth and receive feedback on their work in labs from calibrated faculty.

This proven teaching method is successful as demonstrated by the competency exams they take and pass. The student's ability to visualize the end product has been through "images" in lecture. Students have often commented during Simulation lab sessions that feedback given was constructive but lacked clarity – visually. Line angles, contacts, pulpal/gingival floors are sometimes difficult to truly see, recognize, measure and correct to accepted standards.[1,3]

Several dental School use different type of computer assisted dental simulation that are costly and need continuous maintenance, [1]

New York University College of Dentistry (NYUCD) prides itself on giving its students access to advanced technological devices and methods that help nurture their learning from their pre-clinical Simulation courses. In the D2 year, Esthetics is taught. Concepts and procedures such as Porcelain veneers, peg lateral restorations, ceramic crowns, inlays and most difficult onlays, be it tooth colored or gold are successfully challenged. Lecture, along with pictures has always aided in teaching but adding a video component (DVD) to the inlay, onlay and crown mechanics (path of insertions) has enabled students to learn the concepts visually easier and sooner than traditional learning.

2. Objective

To improve hands on learning in Preclinical course using digital technology as an adjunct.



3. Methods

Second year students are required to attend the simulation lab and prepare few indirect procedures on typodont teeth. They are mandated to observe the DVD of the given procedure (Fig.1). A quiz is administered at the beginning of the session, relating to the particular procedure they are performing that day. The procedure is then demonstrated once again on a monitor at each station. The students start by observing infection control and treating the typodont and manikin head as it is their patient. After equilibrating their typodont a rubber-dam is placed to isolate the tooth/teeth they will be working on (Fig.2)

A printed Self Evaluation sheet is distributed to each student stating all grading criteria guidelines. An example would be an anterior tooth prepared for ceramic crown preparation and provisional. (Fig3A) Criteria such as tapered walls (Undercut, Good, Over taper), depth of the preparation margin (<1.0mm, 1.5-2.0mm, > 2.0mm), incisal clearance (<1.5mm, 1.5-2.0mm, >2.0mm) (Fig.3B), proximal embrasure (Not open, Good, Too wide), gingival extension, at the gingival and following the gingival contour, above or below the gingival margin (<0.5mm, 0.5-1.5mm, >2.0mm) and damage to adjacent teeth. For provisional restorations, the student are evaluated on, contact and contour (open, good, tight), occlusion (hyperocclusion, good, hypooocclusion), [4] and margins [5] (open, good, overextended). While the student is preparing the given procedure on a typodont he/she will utilize the digital camera (Quick Time) DVD with audio narration to virtually get feedback as well as their respective faculty. The DVD video is repeated several times during the pre clinic lab session. The faculty grades the students after the completion of each step with the desired preparation or temporary restoration, still displayed on the students' individual monitors. When the preparation is finished and graded by the faculty, the student is allowed to start working on his/her provisional restoration by applying what they learned from watching the DVD.

4. Discussion

Schools in the United States are using computer based simulation in the laboratory to help students achieve their goals.[2] This method proved to be successful compared to the conventional way of lectures and seminars.

Students and faculty were able to learn or re-learn preparations at the same time with access to a video DVD for reference at home and in school. Students were able to view the DVD, perform the required exercise for that lab session, self evaluate themselves using a distributed criteria sheet and received feedback from the faculty.

5. Conclusion:

The use of Quick Time digital video enabled and motivated dental students to increase hands on Learning in Preclinical Courses. Advances in learning modalities such as prior viewing a DVD Quick Time movie posted on NYU Classes course web-page, resulted in significantly improved student learning and performance on inlays onlays and crown preparations.

References

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Fig.1. Students working on their typodont while faculty evaluating their progress



Fig.2 Student Isolating the tooth before starting the preparation



Fig.3A A capture from the DVD showing the diamond bur to be used



Fig.3B A capture from the DVD showing preparing the facial surface while protecting the neighboring tooth