

# CUSTOMIZED TEACHING PLANS THAT WILL PUSH BOUNDARIES FOR STUDENT EXCELLENCE (PILOT STUDY)

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## **ABSTRACT**

*The purpose of this study is to emphasize the importance of Dental Educators in the pre-clinical setting to identify each student's areas of improvement and customize daily teaching plans, as well as track progress. The aim of the study is to determine if taking the extra time and effort to improve a student's core foundational skills can benefit the student in future practice. 14 students were randomly assigned and were evaluated on their mandible Class I and Class II preparations based on the Modified G.V. Black Cavity preparation guidelines. Each week students were provided tips and methods on improving target areas. Overall, 9 out of the 14 students improved from the study baseline. Changing the culture of teaching Dental students as a whole group to a more individualized and tailored teaching experience, can help Dental Schools graduate outstanding and exceptional healthcare professionals in the field of Dentistry.*

## **KEYWORDS**

*curriculum change, teaching plan, pre-clinical, dental education, student competency.*

## **1. INTRODUCTION**

Practicing dentists are among the many healthcare practitioners that are held to the highest standard for providing excellent care to our patients. In order to provide outstanding service, one must not only be taught the knowledge and skills necessary but also be able to improve any areas that are not of exceptional quality, in order to produce the desired outcome. Because each student has different technical skills, pre-professional students should be taught in a style that is tailored to each individual student. While attending Dental School, every student grasps and learns dental techniques differently; therefore there will be varying areas that may need improvement. Unless these deficiencies are brought to the student's attention and unless they are taught ways to improve it, the student will bring those unsatisfactory skills into the clinic or future dental practices. Even though students are capable of developing the competencies faculty want them to have, the faculty also have an obligation to help them develop their confidence as well [1]. Sometimes many students tend to not ask faculty for critical feedback due to fear of criticism, therefore causing a decrease in self-confidence. In addition, at times, faculty may miss critical teaching opportunities due to overseeing too many students. By continuing to demonstrate these

undesirable skills, the students will not be providing the excellent care he/she is capable of and is required to do for the patient.

Our study aims to provide a method to identify these areas of improvement unique to each student and address them to strengthen the student's skillset. It was hypothesized that by providing additional tips every week to improve target areas, the student will gradually improve the needed skills. This study is unique because it tracks each student individually and their unique target areas to correlate the importance of individualized customized teaching opportunities.

## **2. METHODS**

During the first year of dental school at New York University College of Dentistry, students take the pre-clinical General Dentistry Simulation I course, which allows students to learn and perform a variety of dental procedures on typodonts. The course consists of weekly lab work that students must complete in order to pass the Laboratory portion. For each procedure, students watch instructional videos prior to attending the assigned lab session. At the beginning of the session, there is an instructional demonstration, after which students are then instructed to attempt the procedure. After a student completes the procedure, the student gives their work to a faculty member who will critique the student's attempt. After critical feedback, the student revises the needed areas, and then is re-evaluated and signed off for completion of the mandatory work. The student does this for every procedure until the course ends. Since the lab work varies and there is no method to track each student, there is no way of knowing quantitatively if the student is producing the same critical mistakes week by week or improving.

This study is registered and IRB approved by the University Committee on Activities Involving Human Subjects at New York University with exempt status. One random row of fourteen students in the General Dentistry Simulation I (GDS-I) at New York University College of Dentistry (NYUCD) was informed of this pilot study. A consent information sheet was provided to each student explaining the purpose of the study. The students needed to be enrolled in the DDS first year (GDS-I) course at NYUCD. The participants were told that the study was completely confidential, that they did not need to write their name or student ID. In addition, they were told that there was no risk in participating in the survey and that their participation was entirely voluntary. The research was anonymous, no monetary rewards and, no increase in grade was offered. The participants could refuse to participate or withdraw at any time without penalty. Nonparticipation or withdrawal would not affect the services they receive at NYUCD.

During the months of September to October, the random row of fourteen first year dental students would be learning and practicing the mandibular Class 1 and Class 2 Molar Cavity Preparations based on the Modified G. V. Black Cavity preparation guide lines. One row instructor and the student researcher would follow and observe these students for improvement and progression. During the first initial cavity preparation, the students were evaluated and the data was recorded as a baseline and used to track any progression. The baseline consisted of: Outline form, Pulpal Depth, Axial Depth, Buccal/Lingual width, Broken Gingival Contact, Smooth walls, Unsupported Enamel and Buccal/Lingual contact. In the beginning of the laboratory session, the student researcher worked with each student and expressed areas of concerns from the previous week and noted their improvements. Next, the student researcher showed techniques to fix those target areas. For the remainder of the session, the students worked on the lab work, after which the row instructor would reevaluate the work to see if it was acceptable and give critiques for

improvement and record the data. As each week progressed, the students were provided additional tips and methods on improving the target areas. The new areas that needed improvement were also recorded. After 4 weeks, all data were analyzed for a trend in improvement (Figure 1). After the study concluded, a survey form (Figure 2) was given for anonymous evaluations of the study, to correlate the students' perspective with the data that was recorded

## RESULTS

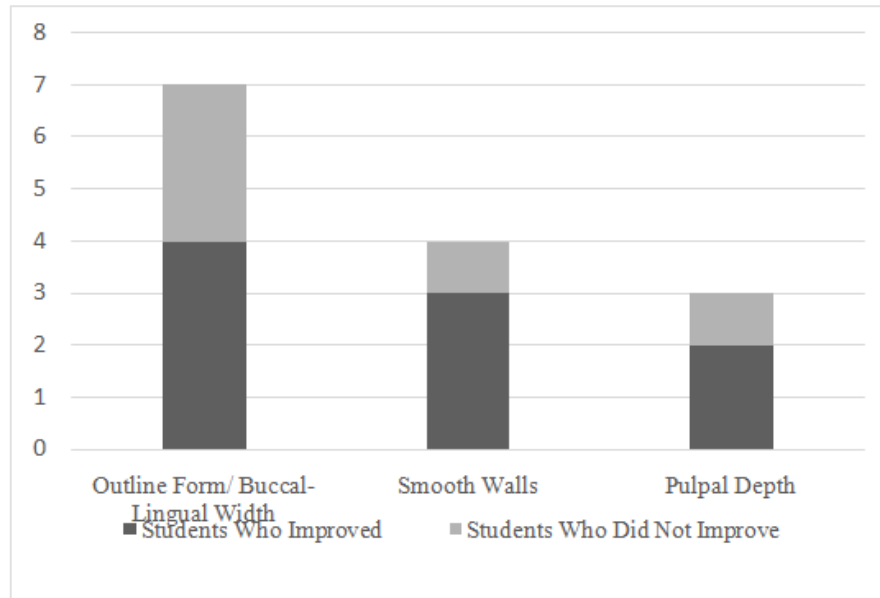


Figure 1 Students Who Improved vs. Students Who Did Not Improve

Figure 1 shows that out of 7 students who needed help in outline form and B/L width from the baseline, 4 out of the 7 improved over the four week period. (57%)

Out of 4 students who needed help in smooth walls from the baseline 3 out of 4 improved over the 4 week period. (75%)

Out of 3 students who needed help in pulpal depth from the baseline, 2 out of 3 improved over the 4 week period. (66%)

Overall there was an improvement in the areas that the students needed help with.

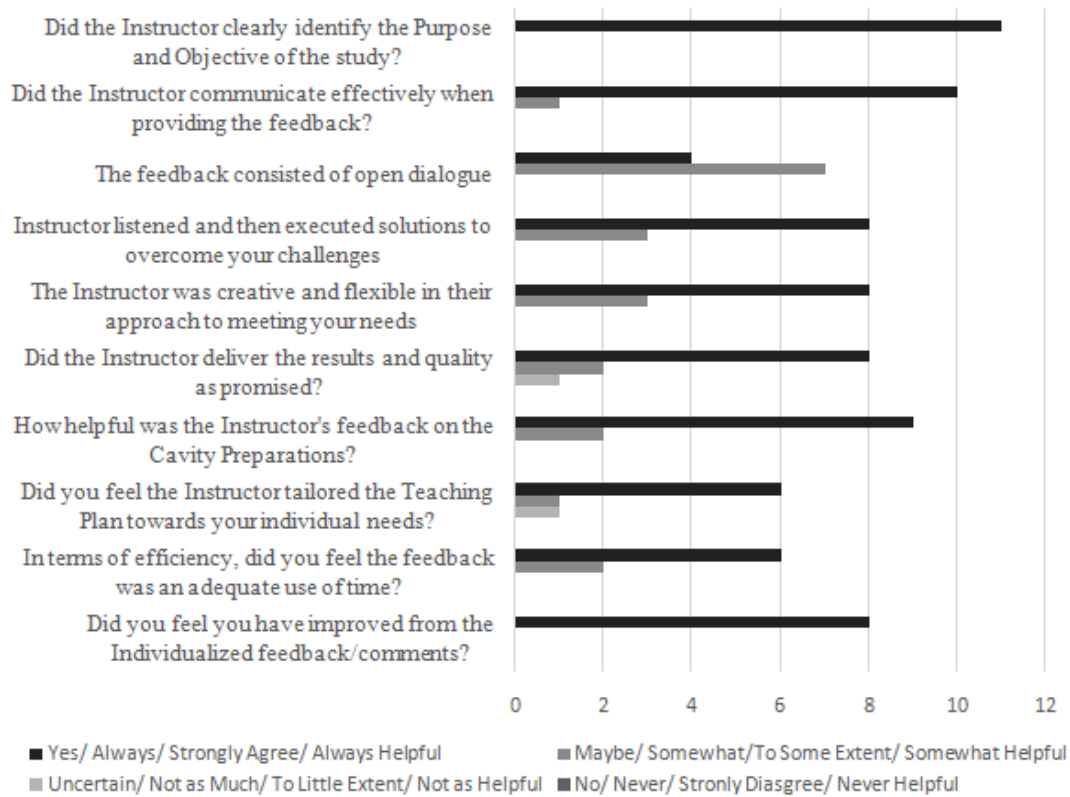


Figure 2 Feedback Survey Results

Figure 2 shows that 11 out of 14 students filled out the survey to determine if they felt the customized teaching plan was effective and 8 out of 8 students felt that the individualized feedback helped them improve.

### 3. DISCUSSION

For some students, there were additional target areas for improvement that were noted and improved as well. In addition, for some students, not all target areas were improved, however if the majority of the areas were improved, this was recorded as an overall improvement. Overall, there was a successful rate of improvement in the areas that the students individually needed help with. There was a 57% improvement for students who needed help in outline form / buccal-lingual width, a 75% improvement for students who needed help in smooth walls and 66% improvement for students who needed help with the pupal depth. According to the feedback, the majority of the students felt the advice and tips were helpful and they felt that they had improved due to the individualized feedback and comments. The feedback survey also showed that the way the instructor approached and communicated to the student were vital to the student's learning experience. When the instructor can clearly communicate and the students can approach the instructor for help and questions, the students tend to improve better.

Dental education in the Pre-Clinical setting is vital in making sure the students develop manual dexterity as well as understand all procedures that are needed to be successful in clinic. Some studies have shown that GPA, DAT, and NBDE Part I scores were poor predictors of clinical success [2,

3]. There have been several studies that tried to show a correlation between student performance in preclinical vs. clinical settings, but no studies have been performed on identifying weaknesses in a student's preclinical skills in order to be able to improve it for clinical success. Two studies did measure the relationship between student performance in preclinical and clinical courses based on students' working on a typodont and on a live patient [4, 5]. A study gathered from alumni revealed that improvements in dental curriculums were applicable [6].

There were some several confounding factors that may have impacted the results from the study. These factors include: the number of times each student practiced outside of assigned lab sessions, time spent practicing outside of assigned lab sessions, different techniques used other than advice given from student researcher and instructor, as well as additional help from upperclassmen or peers. These factors could have influenced whether or not the student improved in the target areas. For future studies on this specific area, inclusion of a control group, increasing the sample size, increasing the study period, as well as reproducing the study with similar results are all recommended. Velayo studied the relationship between preclinical and clinical grades and found a positive correlation between these (7). However further research needs to be done on identifying the specific factors that can influence success either in the preclinical courses or in clinic [7].

#### **4. CONCLUSION**

The purpose of Dental Education in the pre-clinical setting is to prepare students to provide the best possible care to patients in the school clinic as well as the community. Students should continue to build and develop the core foundation during their clinical education and graduate successfully ready to enter the Dental profession. Any knowledge or skills learned in the pre-clinical setting will help the students when they enter the clinic. Other studies have shown that factors such as parts of the Dental Admission Test prior to Dental school can also predict pre-clinical and clinical performance [8,9,10].

The pilot study concludes that more than half of the students who needed help in some aspect of cavity preparation improved from the baseline over the four-week period. The positive results that were obtained from this study support and prove that customized teaching plans are vital and beneficial in the pre-clinical setting. This study can be used as a tool to show and educate dental schools and faculty members how a new innovative method of teaching can greatly impact the students and thus produce outstanding healthcare professionals into the field of Dental Medicine. This study should help emphasize to Dental Schools the importance of preclinical coursework in the training of future successful Dentists.

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