

Students' Attitude Towards Dental CAD/CAM Systems: A Questionnaire Study

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Abstract

This study was conducted to assess the knowledge and attitude of dental CAD/CAM systems among dental students in UMF Cluj-Napoca, Romania. A questionnaire based survey containing 11 questions to assess the knowledge and attitude on dental CAD/CAM systems. The questionnaire was applied to 115 dental students from UMF Cluj-Napoca. Descriptive statistical analysis was performed and results were expressed as a number and percentage for each question. A significant percentage of dental students said that they heard about dental CAD/CAM systems (96,5%), although less than half saw a dental CAD/CAM restoration (45,2%). Even if only 67% of dental students saw a CAD/CAM dental system, 87% consider that dental CAD/CAM systems represent the future of prosthetic dentistry. The results showed that, even if the concept of "dental CAD/CAM systems" is not completely understood, the subjects of our study are interested to be informed about this topic. Knowing the concept of "CAD/CAM" represent the first step for technological progress in education.

Keywords: dental CAD/CAM systems; students; survey; education.

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1. Introduction

The clinical environment is where the dental student first applies the knowledge and skills which were acquired in earlier training and preclinical courses. It is the responsibility of the clinical faculty to guide and help the student so that he may overcome the immediate problems that can occur from lack of experience or ability. Therefore, a joint effort is necessary by both student and faculty [1]. Digital dentistry nowadays offers dentists and dental technicians a variety of possibilities in manufacturing aesthetically and clinically interesting materials. New tools like intraoral cameras, 3-D printers and software solutions for the planning of medical care shorten the working process and also offer a more secure treatment of patients. However the question to be asked is if the new techniques will be integrated into the education of our dentists? [2]. As technology advances, so should we. Many times, however, as technology takes its leaps and bounds, we are left behind due to lack of understanding, resistance to change or intimidation. Such is the case with computer-aided design/computer aided-manufacturing (CAD/CAM) in prosthetics and orthotics [3]. As of 2011, it was estimated that 10,000 units were in use in the United States and Canada [4]. William Blair and Company estimated sales of systems in 2012 at about 2,800 units and predicted a rise to 9,100 units per year in 2017 [5].

2. Material and methods

The present study included a number of 115 dental students. An original questionnaire containing 11 questions was used to collect the data. The questionnaires were distributed by the faculty members of Department Of Prosthetic Dentistry of UMF "Iuliu Hatieganu" Cluj-Napoca, Romania. The respondents were asked to return the questionnaire immediately. All returned questionnaires were coded and introduced in Google Forms. The results were expressed numerically and as a percentage, using the Excel spreadsheet. The study was approved by the Medical Ethical Commission of "Iuliu Hatieganu" University of Medicine and Pharmacy in Cluj-Napoca, Romania, no. 179 from 16 May 2014.

3. Results

Among a total of 115 dental students 51 were Dental Technician students and 64 Dental Medicine students. A significant percentage of students said that they heard about dental CAD/CAM systems (96,5%) and 67% saw a dental CAD/CAM system, although less than half saw a dental CAD/CAM restoration (**Figure1**).

When provided the opportunity to write down any word/phrase they thought would be important to associate with CAD/CAM technology (Question no.5), they wrote "computer", "innovation", "future" and "the robot of dental office". When students were asked to choose some terms that can be correlated with CAD/CAM systems, 101 (87,8%) of them selected the word "scanner" (**Table 1**)

Question no.10 asked students to choose some materials that can be CAD/CAM processed. These results are presented in **Table 2**.

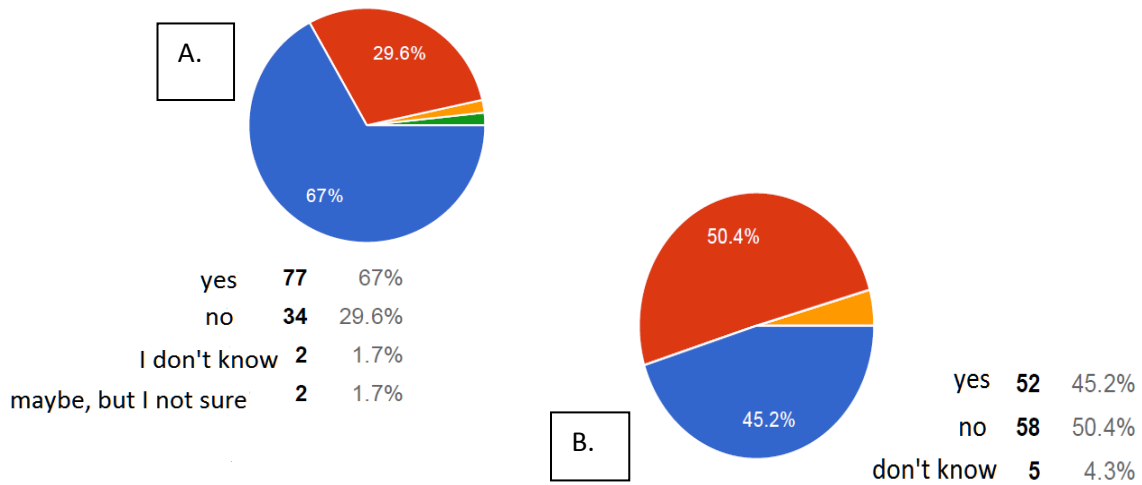


Figure 1: **A.** Students that saw a dental CAD/CAM system; **B.** Students that saw a dental CAD/CAM restoration.

Table 1: Students opinion regarding CAD/CAM systems terms

Term	Number (%)
Scanner	101 (87,8)
Investment material	3 (2,6)
Poured crown	10 (8,7)
Optical impression	96 (83,5)
Milled crown	91 (79,1)
I don't know/I don't answer	1 (0,9)

4. Discussion

Our study evidences that a large number of dental students are interested and enthusiastic regarding dental CAD/CAM systems. An article on the internet describes nowadays dentistry: “This is an exciting time in dentistry and will be cause to reflect on how processes were taught to you in dental school. The younger graduates, who have grown up with Xbox and Wii, are used to seeing these 3-D renderings and will probably have an easier time adapting these concepts in their dental practices”[6]. With the amount of medical information doubling every year, it is obvious that education will be increasingly dependent on information technology to enable teachers and learners to cope with the growing amount of information necessary to keep up-to-date in this field [7]. The study of Huang et al on knowledge, attitude and practice of antibiotics highlights that china medical curriculum improves students knowledge of usage of antibiotics appropriately [8]. According to Kavarthapu Avinash and Dr. Suresh the mechanism and use of CAD/CAM was taught to 40.2% of the total

sample size and 64.8% knows that the future is in the hands of CAD/CAM. This lag in the knowledge of mechanics is because of the theoretical knowledge about it couldn't be transferred to practical situation [9]. The limitation of our study would be the number of the respondents. Our sample was limited to students from the University of Medicine and Pharmacy "Iuliu Hatieganu" of Cluj-Napoca, Romania. Another limitation of our study was to engage research partners that could distribute and collect the questionnaires.

Table 2: Students opinion regarding materials for processing by CAD/CAM devices

Term	Number (%)
Wax	38 (33)
Metal	58 (50,4)
Acryl	34 (29,6)
Zirconia	95 (82,6)
All above mentioned	22 (19,1)
None above mentioned	1 (0,9)
I don't know/I don't answer	3 (2,6)

Regarding future development, 87% of students consider that dental CAD/CAM systems represent the future of prosthetic dentistry.

5. Conclusion

Our study has showed that even if the concept of "dental CAD/CAM systems" is not completely understood, the subjects of our study are interested to be informed about this topic. Knowing the concept of "CAD/CAM" represent the first step for technological progress in education.

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