



Short Communication

ISSN: 2581-3218
IJDR 2019; 4(1): 01-04
© 2019, All rights reserved
www.dentistryscience.com

Assessing Students' Perspectives of an Elective Digital Dentistry Course

Les Kalman¹, Elham Vakili¹

¹ Assistant Professor, Restorative Dentistry, Coordinator, Dental Outreach Community Service, Schulich Dentistry, Western University, Dental Sciences Building, Rm. 1003 1151 Richmond St., London, ON, Canada N6A 5C1

Abstract

This brief report examines students' perspectives on teaching from a small size of fourth year dental students and Internationally Trained Dentists II candidates on an experiential learning digital dentistry elective course. A questionnaire was developed and distributed to 10 dental students before and after the course. Each question was rated on a five-point Likert scale. The Wilcoxon Signed Ranks Test was used. All data analysis was conducted by Excel at the 0.05 level of significance. The results indicated that after receiving the course the mean of students' perspectives varied more. The medians varied before and after the course. There was a 90% improvement that was detected in the students' perspectives after the course. All of the students (100%) reported an improvement in knowledge with the digital scanner after the course. Although students' perspectives demonstrated a change in almost all the participants (90%) after receiving the course, this change was not statistically significant. There was no significant difference in students' knowledge of digital dentistry before and after receiving the course. Conclusion: The dental profession is rapidly changing technologically. It seems appropriate that dental education should include digital dentistry and a suitable number of student participants.

Keywords: Digital Dentistry, Dental Technology, Dental Education, Advanced Imaging Techniques, Digital Impressions, Digital Camera.

INTRODUCTION

The ultimate goal of Canadian dental education is the development of a competent beginning general dentist that can provide independent oral health care to individuals and communities in a culturally sensitive manner [1]. There are five competencies that include: patient-centered care, professionalism, communication and collaboration, practice and information management and health promotion [1]. Many of these areas have become technologically advanced and rely heavily on a digital workflow [2]. Unfortunately, the curriculum at most dental schools do not keep pace with technological advances [3], and students may lack the necessary exposure and training required for current practice [3].

Traditional dental education is heavily based on didactic lectures to a large number of students. This is partly due to the historic nature of education [3] and the growing challenge of an appropriate faculty-student ratio for dental education [4]. It has been demonstrated that a higher level of thinking may be achieved from advanced methods of teaching [5], and that small-size experiential learning may be more appropriate for student learning [5].

This brief report examines students' perspectives on teaching from a small size of fourth year dental students and Internationally Trained Dentists II candidates on an experiential learning technology-based dental elective course.

Background

Western University is located in London, Ontario, Canada and is home to the Schulich School of Medicine & Dentistry, one of two dental schools in the province and one of 10 in the country. Clinical experience is generally achieved in the third and fourth year of the dental program and in year I and II of the Internationally Trained Dental (ITD) candidates program. The clinical curriculum remains focused on fundamentals and principles and maintains a traditional workflow in restorative dentistry.

An experiential learning elective, termed digital dentistry, was developed to expose fourth year dental

*Corresponding author:
Dr. Les Kalman
0142Q Dental Sciences Building
Western University
1151 Richmond Street
London Ontario
N6A 3K7
Tel: +1-519-636-6933
Email:
ljkalman@icloud.com

students and ITD II candidates to advanced digital imaging techniques and workflows. The course was limited to 10 students. Instructional information was delivered through an interactive seminar-based 2-hour presentation, with numerous resources made available to the students. The students then participated in an experiential learning hands-on workshop delivered in cubicles within the main patient clinic. Students had 45 minutes to work with each technology to solve real life clinical issues. The technologies included: (1) the 3M True Definition Scanner for digital impressions (2) a digital camera with macro lens for patient and intra-oral photography (3) a wi-fi based smart phone connected intra-oral camera (4) laptop and image software for image editing and exportation and the (5) Max Align, a virtual facebow tablet alternative. The goal of the course was to provide exposure and awareness to current dental technologies with actual patient cases.

MATERIALS AND METHODS

A questionnaire was developed (Appendix I) and distributed to the 10 dental students before any information was presented. The same questionnaire was distributed to the same 10 dental students at the end of the workshop. Each question was rated on a five-point Likert scale (strongly disagree: 0, disagree: 1, neither agree nor disagree: 2, agree: 3 and strongly agree: 4). The response system produced a range of 0-40 for the total questionnaire score, where a higher score represented a better understanding of digital technologies. The total score was calculated by adding each score in each questionnaire. The score change

was calculated by subtracting the total score *before the course* in each question from the score *after the course*. To compare the student's perspective before and after the elective course, the Wilcoxon Signed Ranks Test was used. All data analysis was conducted by Excel at the 0.05 level of significance.

RESULTS

Table 1 displays the student's responses before and after the course and Figure 1 illustrates the boxplot. The boxplot illustrates that after receiving the course, the mean of students' perspectives varied more. The medians varied before and after the course, which illustrated that the students' total perspective values increased. There was a 90% improvement that was detected in the students' perspectives after the course. All of the students (100%) reported an improvement in knowledge with the digital scanner after the course. Although students' perspectives demonstrated a change in almost all the participants (90%) after receiving the course, this change was not statistically significant. It seems that there was no significant difference in students' knowledge of digital dentistry before and after receiving the dental imagery course.

The data set is extremely limited (n=10) and should be expanded to offer increased scientific validity. Increasing the sample size would require more students, more time for the faculty member and more resources endured by the dental school.

Table 1: Students' Perspectives Scores

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Q1b	4	3	3	3	3	2	0	3	1	3
Q1a	3	3	4	4	4	3	3	3	3	3
CHANGE	-1	0	1	1	1	1	3	0	2	0
Q2b	1	2	1	1	1	3	0	3	1	2
Q2a	3	3	3	3	4	3	3	3	3	3
CHANGE	2	1	2	2	3	0	3	0	2	1
Q3b	1	3	2	2	2	2	1	3	1	1
Q3a	3	3	3	2	2	2	3	3	2	3
CHANGE	2	0	1	0	0	0	2	0	1	2
Q4b	4	3	3	3	4	3	3	3	2	3
Q4a	3	3	3	4	4	3	3	3	3	3
CHANGE	-1	0	0	1	0	0	0	0	1	0
Q5b	3	3	3	3	2	3	3	1	2	3
Q5a	3	4	3	3	3	4	3	3	3	4
CHANGE	0	1	0	0	1	1	0	2	1	1
Q6b	0	0	3	1	1	4	0	1	1	1
Q6a	4	3	3	4	4	3	3	3	3	4
CHANGE	4	3	0	3	3	-1	3	2	2	3
Q7b	3	1	1	1	1	1	0	2	1	1
Q7a	4	4	3	4	4	3	3	3	3	4
CHANGE	1	3	2	3	3	2	3	1	2	3
Q8b	0	3	0	1	3	3	0	1	0	1
Q8a	2	3	3	3	2	1	2	3	2	3
CHANGE	2	0	3	2	-1	-2	2	2	2	2
Q9b	0	2	0	1	1	0	0	0	0	1
Q9a	0	2	0	1	1	0	4	0	0	1
CHANGE	0	0	0	0	0	0	4	0	0	0
Q10b	4	3	4	4	3	4	4	3	4	3
Q10a	4	4	3	3	4	3	3	3	3	3
CHANGE	0	1	-1	-1	1	-1	-1	0	-1	0
Total b	20	23	20	20	21	26	11	20	13	19
Total a	29	32	28	31	32	26	30	27	25	31
CHANGE	9	9	8	11	11	0	19	7	12	12

P: Participant.

Q: Question.

b: Before the course.

a: After the course.

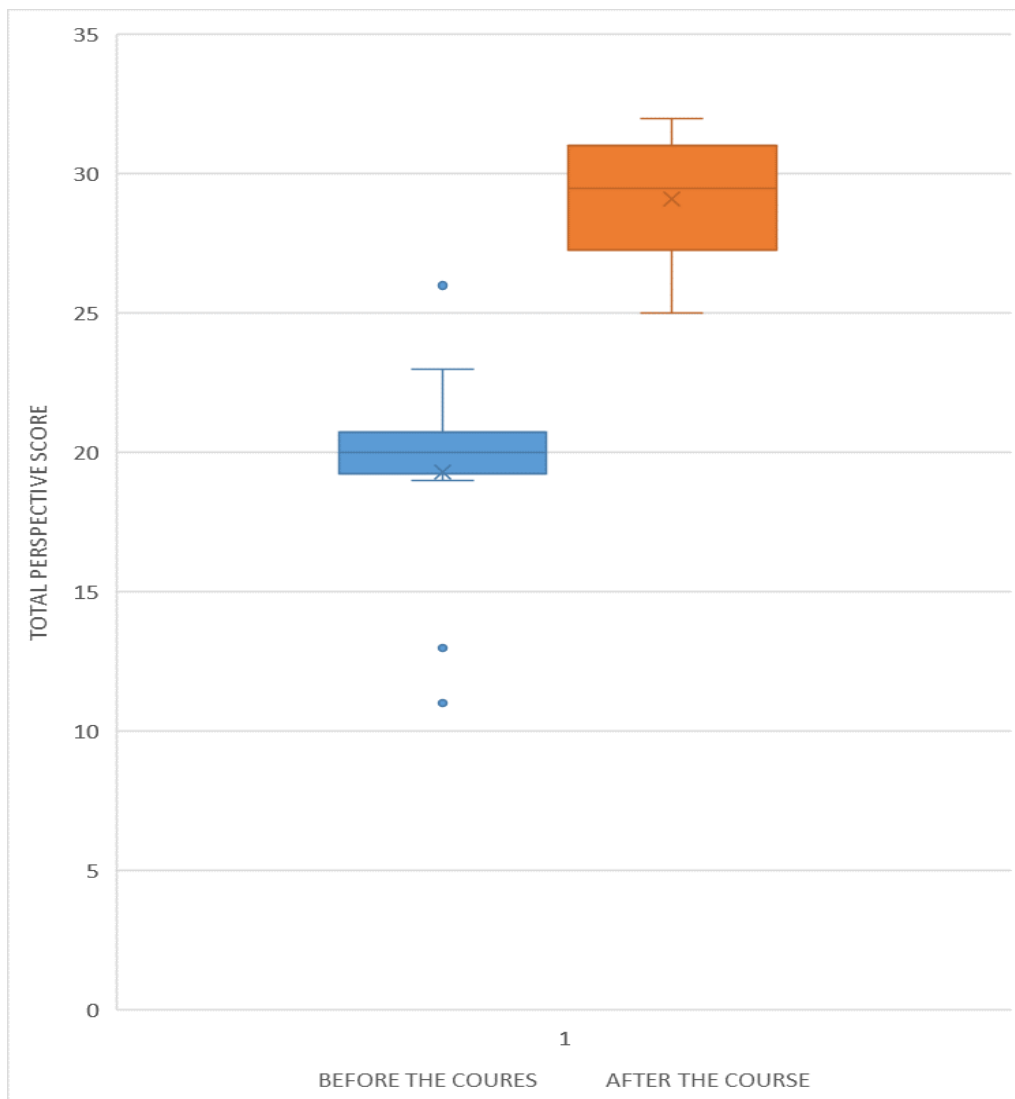


Figure 1: Boxplot Comparison of Students' Perspectives After the Course (orange box) and Before the Course (blue box)

DISCUSSION

Dental education, similar to other academic fields, has undergone fairly extensive modifications. The delivery of modern oral health education necessitates adaption of pedagogical methodologies that invoke higher level thinking skills. Gies highlighted the early need for curriculum transformation in dental schools for "advancement of teaching" [6]. Furthermore, the drive for a pedagogic transformation in dental education, towards a more technologically-based curriculum, has been invoked in a variety of scientific studies [7-10]. The rationale for this widespread interest in curriculum reform is believed to be the academic institutions themselves, with the aim of improving the quality of oral health education to dental students. By improving the education, graduates will be adequately prepared for a professionally competitive market [7]. Baum [9] suggested that a number of different factors, including shifting the demographic patterns, enhancements in medical fields, a phenomenal shift in delivering cutting-edge health care and economic conditions, have impacted the need for an emphasis on curriculum reform in dental education.

CONCLUSIONS

It is apparent that the dental profession is rapidly changing technologically. It seems appropriate that dental education should also adapt a dynamic change toward emerging digital technologies. Experiential learning/hands-on workshops should be of adequate length to allow the learner ample time to become competent with dental technologies. Course evaluation, including student perspectives,

requires a significant number of participants, faculty and resources. By cultivating a technologically-enhanced dental curriculum, the dental profession will benefit from an excellent caliber of competent dentists.

Conflict of Interest

The author reports no conflicts of interest in this work.

REFERENCES

1. Association of Canadian Faculties of Dentistry. ACFD educational framework for the development of competency in dental programs [updated 2015 Feb 12; cited 2018 Feb 3]. Available from: <http://acfd.ca/about-acfd/publications/acfd-competencies/>.
2. van der Zande MM, Gorter RC, Aartman IH, Wismeijer D. Adoption and use of digital technologies among general dental practitioners in the Netherlands. *PloS one* 2015;10(3):e 0120725.
3. Rossomando EF, Moura M. The role of science and technology in shaping the dental curriculum. *J Dent Educ* 2008;72(1):19-25.
4. Formicola AJ. Trends in Dental Faculty of U.S. Dental Schools, 2003-04 to 2013-14. *J Dent Educ* 2017;81(8):e S33-eS40.
5. Yakovleva NO, Yakovlev EV. Interactive teaching methods in contemporary higher education. *Pac Sci Rev* 2014;16(2):75-80.
6. Geis WJ. Dental Education in the United States and Canada: A Report to the Carnegie Foundation For the Advancement of Teaching. The Carnegie Foundation For the Advancement of Teaching; 1926.
7. Garrison DR, Kanuka H. Blended learning: Uncovering its transformative potential in higher education. *Internet High Educ* 2004;7(2):95-105.

8. Saffari SS, Frederick Lambert R, Dang L, Pagni S, Dragan IF. Integrating student feedback during “Dental Curriculum Hack-A-thon”. *BMC Med Educ* 2018;18(1):89.
9. Baum BJ. The dental curriculum: what should be new in the 21st century? *J Public Health Dent* 1996;56(5):286-90.
10. Pyle M, Andrieu SC, Chadwick DG, Chmar JE, Cole JR, George MC, et al. The case for change in dental education. *J Dent Educ* 2006;70(9):921-4.