Dental students' perception of theater-based learning as an interactive educational tool in teaching oral surgery in Jordan

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ABSTRACT

الأهداف: تقييم إدراك طلبة طب الأسنان الأردنيين لمفهوم التعلم في غرفة العمليات الجراحية وتحليل تأثيرها على مستوى المعرفة لديهم وعلى قراراتهم المستقبلية المتعلقة بالمهنة.

الطريقة: أجريت الدراسة في قسم جراحة الفكين، الجامعة الأردنية خلال الفترة من سبتمبر 2007م و مارس 2008م، على خريجي طب الأسنان من 2005م لغاية 2007م. تكونت العينة من 157 طالب وخريج. تعرض 72 منهم لتجربة التعلم في غرفة العمليات، وخضع 85 لتعليم جراحة الفم التقليدي. قام أفراد العينة بتعبئة استبيان من 23 مهارة وعبارتين تتعلق باختيار المهنة في المستقبل.

النتائج: أظهر الطلبة الذين خضعوا لتجربة غرفة العمليات قدرة أفضل على فهم العمليات الجراحية (أجاب 71% بعبارة "مناسب" أو أفضل مقارنة مع 38% لطلبة المجموعة الثانية)، وأظهروا مقدرة أكبر على فهم بروتوكولات غرفة العمليات ومنع العدوى، وقيمة العمل كفريق (96%: "مناسب" أو أفضل، 81% للمجموعة الثانية)، كذلك عبرت عن قدرة أكبر للتعامل مع المضاعفات الجراحية (94%: "مناسب" أو أفضل، 82% للمجموعة الثانية)، كما أظهروا إدراكاً أفضل لواجبات المقيمين، وقدرة أعلى للتأقلم مع بيئة المستشفى (88%: "مناسب" أو أفضل، 71% للمجموعة الثانية) (القيمة الإحصائية (p=0.000)، . أظهرت المجموعة الأولى اهتماماً أكبر باختيار جراحة الفم كتخصص مستقبلاً (53% كانوا "متأكدين" مقارنة مع 33% "متأكدين" للمجموعة الثانية) (p=0.007). كما تم الحصول على نقاط ألفا (0.50 إلى 0.90) لقيم الاستبيان.

خاتمة: كان التعلم في غرفة العمليات الجراحية وسيلة تعليمية تفاعلية وناجحة في تعلم جراحة الفم، حيث أن اندماج الطلبة التفاعلي في المجالات العلاجية العملية يؤدي إلى مناخ تعليمي أفضل ويؤسس برامج الدراسات العليا في جراحة الفم والفكين.

Objectives: To evaluate dental students' perception of theater-based learning, and explore its association with their clinical knowledge and future career decisions.

Methods: This cross-sectional study was carried out in the Oral Surgery Department, Jordan University Hospital, Amman, Jordan between September 2007 and March 2008 on dental students of batch 2005-2007 comprising 157 students and graduates. Seventy-two subjects were exposed to theater-based learning (group 1), and 85 subjects had conventional oral surgery teaching (group 2). All subjects completed a questionnaire consisting of 23 skills and competencies with 2 career-related items.

Results: Students with theater experience perceived better ability to describe surgical procedures (71% of students in group 1 reported "adequate" or higher levels compared to 38% as reported by group 2 students, more understanding of theater and cross infection control protocols and teamwork value (96% in group 1 responded "adequate" or higher, 81% by group 2 students), higher competence to deal with complications (94% in group 1 responded "adequate" and 82% by group 2 students), more awareness of resident's duties and more familiarity with hospital environment (88% in group 1 and 71% by group 2 students) (p=0.000). They showed more interest in oral surgery as a career (53% of group 1 responded "certain", 33% by group 2 students) (p=0.007). Alpha reliability scores of 0.50-0.90 were obtained for the questionnaire subscales.

Conclusion: Dental students perceived theater-based learning as a valid interactive educational tool. Active integration of dental students can lead to a superior educational experience, and promotes postgraduate surgical programs.

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Teaching strategies of Oral and Maxillofacial Surgery for undergraduate dental students can vary across dental schools, and also differ among clinical teachers. Multiple dental undergraduate curricula were produced over the last few years,[1] the Dented III-Association for Dental Education in Europe (ADEE) published the Profile and Competencies for the European Dentist, which outlines major and supporting competencies in Oral Surgery curriculum,[2] with the latter subject to individual school variation. However, a dental student is generally required to have an understanding of the range of surgical procedures, which may be used to manage diseases, and disorders of the mouth and jaws.[3] In order to facilitate the acquisition of this clinical knowledge in the competency-based dental and medical education,[4] active participation of students in the workplace is advocated, which will help them develop their professional identity.[5] The operating theater provides an interactive learning environment that was considered by medical students a challenging place in which to learn.[6,7] Theater-based learning has been investigated as an educational tool in teaching undergraduate medical students who considered it essential to enhance their knowledge of relevant anatomy, and improve their awareness of the complications of surgery.[6,8,9] It was also found essential by students and consultants to appreciate standard theater protocols, and be aware of risks to self, patients and staff, thereby helping students to become familiar with surgery and its environment, and demonstrating the need to work well in teams.[8] Stark[10] reported that teaching in theaters influenced students' future career choice, and therefore, has a role in promoting recruitment into surgical specialties. Interestingly, evidence suggests that a correlation exists between the amount of exposure to a medical field with the application rates to that specialty.[11] No previous reports in the literature have evaluated the theater-based learning role in Oral Surgery education. This study aims to evaluate dental students' perception of their experience of theater-base learning, and explore its association with their clinical knowledge and future career decisions.

Methods. This cross-sectional study was carried out in the Oral Surgery Department of Jordan University Hospital, Amman, Jordan between September 2007 and March 2008, on dental students of the academic years 2005-2007. The sample included final year undergraduate dental students of 2007-2008, dental graduates of the academic years 2005-2006, and 2006-2007. In order to investigate students' perception of theater-based learning they experienced, all students were asked to rank their perceived level of skills and competencies listed in a questionnaire of 23 items, using a 5-point Likert scale (1 = very well, 5 = poorly), or (1 = yes, always, 5 = never), in addition to 2 items related to students' career choice (**Appendix A**). The questionnaire design was based on data obtained by Fernando et al,[12,8] and Lyon[6] in their qualitative studies to assess theater-based learning experience of undergraduate medical students, as no validated questionnaire is available in the literature to assess learning experience in the operating theater for dental students. Oral surgery-related items were also added to the questionnaire. The questionnaire commenced with an overview of the study objectives. Students were then asked to state if they have ever attended theater sessions, and to specify the frequency of attendance, thereby 2 groups of students formed the sample. The first one comprised of those who were exposed to the theater-based learning experience during their clinical years, compared to the rest of the students who had conventional oral surgery teaching. The included subjects were all in the University of Jordan final year (2007) students, or graduates from the years 2005 and 2006. We excluded subjects who were enrolled in any postgraduate dental program, and those who had oral surgery training after graduation. The student group's characteristics were compared in terms of gender, grade in Oral Surgery, and also according to whether or not they had interest in surgery prior to joining the dental school, and with all subjects falling in the age range of 21-25 years. Students of the first group were also asked to rank 6 statements related to their learning experience in the theater on a Likert scale from 1 (yes, absolutely sure about it) to 5 (no, absolutely not) (**Appendix B**). All subjects were informed that involvement in the study was entirely voluntary. Fifth-year undergraduate dental students were asked to fill out the questionnaire, or return it blank if they were not willing to participate (n=97). The questionnaire was also sent to all dental graduates of the years 2005-2006 (n=74), and 2006-2007 (n=85) mainly to their e-mail addresses, and the rest was handed out in person. Reminders were sent after completing all primary replies. All participants signed a consent form, and no ethical approval for the study was needed, but permission to conduct the study was approved by the Scientific Research Committee of the Faculty of Dentistry of the University of Jordan, Amman, Jordan.

The reliability of the questionnaire and its subscales was assessed using Cronbach alpha. The descriptive statistics were reported as the mean and standard

*The full text including Appendix is available in PDF format on Saudi Medical Journal website (www.smj.org.sa)

deviation. The comparative statistics used were the non-parametric methods of Mann-Whitney test, and the one-way analysis of variance (ANOVA) test for assessing gender differences. A $p<0.05$ is considered the level of significance. In addition, correlation analyses were performed to examine the relationship between the subscale mean scores, and frequency of attendance by calculating Spearman correlation coefficients. The statistical analysis was performed using the Statistical Package for Social Sciences software version 13 (SPSS Inc, Chicago, IL, USA).

Results. One hundred and fifty-seven subjects completed and returned their questionnaires, 84 of them were in the final year dental students (2007-2008) with 87% class response rate, 49 were graduates of the academic year 2006-2007 (57.6% class response rate), and 24 graduates of 2005-2006 (32.4% class response rate). Seventy-two students (46%) attended one or more operating theater sessions during their clinical years (first group), while 85 students (54%) had conventional Oral Surgery teaching with no theater-based learning experience (second group). Demographic information on the groups and their characteristics are presented in **Table 1**. There was no statistical difference between the 2 groups in terms of gender, grade in Oral Surgery, or according to their answer to the question of whether they intended to go for the surgical career prior to joining the dental program, with all subjects falling in the age range of 21-25 years. On a Likert scale from 1 (very well, or yes absolutely sure about it) to 5 (poorly or no, absolutely not) students ranked their perceived level of skills and competencies in 23 items. Cronbach alpha scored 0.92 for all 23 statements, when the questionnaire items were divided into 8 subscales, a range of 0.50-0.90 alpha reliability scores was obtained. There were significantly small to moderate levels of

Table 1 - Number, mean age, gender of students and mean grade in Oral Surgery in different academic years for students with theater-based learning experience and students exposed to conventional teaching.

Academic years	Students with theater-based learning experience n=72	Students exposed to conventional teaching n=85
	n (%)	
2007-2008		
Male	6 (26)	12 (20)
Female	17 (74)	49 (80)
2006-2007		
Male	12 (39)	4 (22)
Female	19 (61)	14 (78)
2005-2006		
Male	4 (22)	2 (33)
Female	14 (78)	4 (67)
	Age in years, range (mean)	
2007-2008	21-23 (21.9)	21-24 (21.9)
2006-2007	22-25 (23.1)	22-25(23.3)
2005-2006	23-25 (23.9)	23-24 (23.7)
	Grade in Oral Surgery (mean)	
2007-2008	A-B (B+)	A-C+ (B+)
2006-2007	A-C+ (B+)	A-B (B)
2005-2006	A-C+ (B+)	A-C+ (B+)

Table 2 - Reliability of the 8 subscales and the overall student scores, and the correlation between frequency of student attendance and their subscale scores.

Subscales	Subscale items	Dental students (n=157) Reliability (Cronbach's alpha)	Correlation with frequency of student attendance (Spearman's rho)
1	Ability to describe the surgical approach and operative details, regional anatomy, and familiarity with instruments (Q1-Q7)	0.84	0.53*
2	Perceived knowledge of regional anatomy and familiarity with instruments	0.50	0.15
3	Understanding of standard theater etiquette and protocols, and the importance of working with other teams (Q8-Q10)	0.73	0.34*
4	Awareness, competence in dealing with surgical complications, and emotional coping with surgery (Q11-Q13)	0.53	0.35*
5	Awareness of the surgical resident duties and the importance of perioperative patient monitoring (Q14-Q16)	0.62	0.36*
6	Awareness of the cross infection control protocols and the ability to scrub up adequately (Q17-Q18)	0.71	0.49*
7	Awareness of risks in involved theater for patients and medical personnel (Q19-Q20)	0.90	0.20
8	Familiarity with the hospital surgical environment and ability to approach the surgical team to attend and assist during surgery (Q21-Q23)	0.67	0.50*
	Overall score (Q1-Q23)	**0.92**	

*Correlation is significant at 0.05 level (2-tailed). Coding of the subscales was reversed (1 - poorly, 5 - very well) to produce positive correlation. (Q - question)

Table 3 - Group comparison by student responses to skills and knowledge components represented by 8 subscales, and 2 career related items.

Subscales	Subscale items	Academic years	Students with theatre-based learning experience score	Students exposed to conventional teaching score	*P*-value
			Mean ± SD		
1	Ability to describe the surgical approach and operative details (Q1-Q5)	All students	2.64 ± 0.90	3.30 ± 0.82	0.000
		2007-2008	3.50 ± 0.89	3.59 ± 0.64	
		2006-2007	2.36 ± 0.57	2.59 ± 0.76	
		2005-2006	2.03 ± 0.48	2.60 ± 0.95	
2	Perceived knowledge of regional anatomy and familiarity with instruments (Q6, Q7)	All students	2.58 ± 0.73	2.78 ± 0.69	
		2007-2008	2.85 ± 0.71	2.82 ± 0.62	
		2006-2007	2.63 ± 0.69	2.67 ± 0.77	
		2005-2006	2.17 ± 0.64	2.67 ± 1.13	
3	Understanding of standard theater etiquette and protocols and the importance of working with other teams (Q8-Q10)	All students	1.94 ± 0.66	2.46 ± 0.81	0.000
		2007-2008	2.23 ± 0.56	2.45 ± 0.82	
		2006-2007	1.92 ± 0.72	2.50 ± 0.73	
		2005-2006	1.59 ± 0.48	2.44 ± 1.03	
4	Awareness, competence in dealing with surgical complications and emotional coping with surgery (Q11-Q13)	All students	2.27 ± 0.64	2.66 ± 0.59	0.000
		2007-2008	2.51 ± 0.70	2.68 ± 0.56	
		2006-2007	2.20 ± 0.61	2.63 ± 0.65	
		2005-2006	2.08 ± 0.54	2.56 ± 0.81	
5	Awareness of the surgical resident duties and the importance of peri-operative patient monitoring (Q14-Q16)	All students	2.12 ± 0.64	2.54 ± 0.65	0.000
		2007-2008	2.38 ± 0.61	2.60 ± 0.64	
		2006-2007	2.11 ± 0.60	2.43 ± 0.71	
		2005-2006	1.81 ± 0.63	2.28 ± 0.57	
6	Awareness of the cross infection control protocols, and the ability to scrub up adequately (Q17, Q18)	All students	2.11 ± 0.86	2.96 ± 0.92	0.000
		2007-2008	2.59 ± 0.90	3.05 ± 0.91	
		2006-2007	1.90 ± 0.75	2.64 ± 0.72	
		2005-2006	1.86 ± 0.76	3.08 ± 1.39	
7	Awareness of risks in involved theater for patients and medical personnel (Q19, Q20)	All students,	1.81 ± 0.61	2.13 ± 0.86	0.025
		2007-2008	1.96 ± 0.62	2.08 ± 0.83	
		2006-2007	1.87 ± 0.63	2.14 ± 0.92	
		2005-2006	1.50 ± 0.45	2.58 ± 0.92	
8	Familiarity with the hospital surgical environment and ability to approach the surgical team to attend and assist during surgery (Q21-Q23)	All students	2.17 ± 0.82	2.78 ± 0.71	0.000
		2007-2008	2.42 ± 0.95	2.82 ± 0.75	
		2006-2007	2.10 ± 0.72	2.60 ± 0.56	
		2005-2006	1.96 ± 0.78	2.89 ± 0.69	
9	Consideration of oral surgery as a future career (Q24)	All students	2.46 ± 1.32	3.02 ± 1.17	0.007
		2007-2008	2.35 ± 1.19	2.87 ± 1.13	
		2006-2007	2.58 ± 1.31	3.56 ± 1.20	
		2005-2006	2.39 ± 1.54	3.00 ± 1.26	
10	Interest in surgery prior to joining dental school (Q25)	All students	2.99 ± 1.17	3.09 ± 1.11	
		2007-2008	3.04 ± 1.07	3.00 ± 1.06	
		2006-2007	3.10 ± 1.11	3.39 ± 1.20	
		2005-2006	2.72 ± 1.41	3.17 ± 1.33	

Data are expressed as mean ± standard deviation within each group by Mann-Whitney U-test. Q - question

Table 4 - Students response to each skill and knowledge component .

Questions	Yes, sure/ absolutely sure	Uncertain/ sometimes	No/never	No answer
		n (%)		
Do you think that attending the operating theater is important for oral surgery education?	65 (96)	3 (4)	0 (0)	4
Do you think that theater is a challenging place to learn?	54 (78)	6 (9)	9 (13)	3
Do you feel that regular attendance in operating theater necessary?	52 (75)	11 (16)	6 (9)	3
Do you prepare specifically for the operating theater session?	27 (41)	28 (42)	11 (17)	6
Did attending influence your future career choice (with or against the surgical specialty)?	49 (72)	12 (18)	7 (10)	4
Do you find it easy to approach the surgical team to negotiate an active part during surgery?	50 (74)	14 (21)	4 (6)	4

correlations between the student perceived level of skills and competencies, with the frequency of attended theater sessions. Significant correlations were found in 6 subscales ranging from 0.34-0.53 (**Table 2**). Mean scores from the Likert scale were calculated for each subscale, and for the 2 items related to students' career choice (**Table 3**). Comparisons were performed using the Mann-Whitney U-test to examine differences in mean ranking for each subscale between the 2 groups in the whole sample, and also between the 2 groups in each academic year. There were statistical differences between the 2 groups of students in all academic years in their scores of 7 subscales. Statistical differences were also found between the 2 groups of students in each academic year: 2007-2008 (2 subscales), 2006-2007 (4 subscales), 2005-2006 (4 subscales). When the students perceived ability to describe the surgical approach and operative details of oral and maxillofacial procedures was compared between the 2 groups, significant differences were found in the subscale scores of the related items (p=0.000) and 71% of students in group 1 reported "adequate" or higher levels, compared to 38% by group 2 students, however, no differences were found between groups within each academic year. There were significant differences between the 2 groups when we compared subscales related to the knowledge of standard theater etiquette and protocols, and the importance of working with other teams (p=0.000) (96% of students in group 1 reported "adequate" or higher, 81% by group 2 students,) ability to scrub up and adhere to sterile procedures (p=0.000), (89% of students of students in group 1 reported "adequate" or higher, 69% by group 2 students, and the awareness of risks to patients and staff in theater (p=0.025) (99% of students in group 1 reported "adequate" or higher, 71% by group 2 students). Significant differences were also found in relation to student awareness of the surgical resident duties in the operating theater, and the appreciation for the need for careful peri-operative patient monitoring (p=0.000) (94% of students in group 1 reported "adequate" or higher, 87% by group 2 students), which was not found between groups within each academic year. Students in the first group reported to be more familiar with the surgical environment in hospital, they found it easier to approach the surgical team to ask for attendance to surgery, and perceived better ability to assist during surgery than the second group (p=0.000) (88% of group 1 students reported "adequate" or higher, 71% by group 2 students). They felt also more competent in dealing with complications after surgery and reported better ability to cope with the emotional impact of surgery (p=0.000) (94% of group 1 students reported "adequate" or higher, 82% by group 2 students). On the other hand, there was no difference between the 2 groups in relation to their familiarity with the regional anatomy and oral surgery instruments. Students with theater-based learning experience reported a significantly higher desire to join a surgical program compared to students in the second group (p=0.007), although there were no significant differences between the 2 groups in their interest in surgery as a future career prior to joining the dental school (p=0.508).

In the second part of the questionnaire, students exposed to the theater-based learning ranked statements related to their experience on a Likert scale from 1 (yes, absolutely sure about it) to 5 (no, absolutely not). Results are shown in **Table 4**, where responses are presented in 3 categories: the first one includes the answers "Yes, absolutely sure about it," and "yes I'm sure," the second category for "uncertain" answers, and the third one including "no, I don't think so" and "no, absolutely not" responses.

Discussion. The approach of modern undergraduate dental education is directed towards providing a learning environment that is student-centered, problem-based and integrated,[13] thereby encouraging and stimulating active involvement in the learning process on students' part. It is suggested that the educational content should be made available to students through a variety of methods, because individual learning styles, and preferences vary considerably.[14] From their own perspective, students considered a disorganized and inefficient clinical learning environment as a weakness point in the dental school curriculum.[15] Several teaching opportunities can be taken to facilitate dental learning, and these include seminars, lectures, journal clubs, audit meetings, clinical teaching, web-based learning,[16] and others. For medical students, attendance to the operating theater is part of the surgical duties in all medical programs. Medical students consider the operating theater as a challenging place in which to learn, and in which they adopted active learning strategies, and attempted to earn a place in the team.[6]

Our results indicated that our dental students who experienced theater-based learning were generally in close agreement with medical students' perception of the learning outcome of theater attendance. They felt more competent to describe the surgical approaches, and operative details related to various maxillofacial procedures, a finding that was stated by medical students who indicated that going to theater gave them a better understanding of surgery than they obtain from reading textbooks.[6] However, other medical students reported feeling like a burden to the surgical team, and desired more instruction.[17] Our students perceived also better understanding of the surgical complications and better ability to deal with complications related to their

own work, and felt they could cope with the emotional impact of surgery at work better than students with no theater-based learning experience. They reported having acquired skills to become an active member in the surgical team, such as the ability to assist during surgery, and showed better understanding of the standard theater protocols and risks involved in the theater, skills that were stated to be essential by medical teachers, and their students.[8] Our students ranking of these skills correlated favorably with the frequency of theater attendance. Interestingly, Cloyd et al[18] reported that many surgeons felt that student's presence in the operating room actually enhanced the learning environment. However, students with theater experience did not perceive a significant difference in the knowledge related to oral surgery instruments, neither to their knowledge of the anatomy of the maxillofacial region compared to the rest of the students. This could be partly explained by the possibility that some surgeons may find difficulty in teaching students while performing operative procedures,[9] and poor preparation for theater attendance on the student part.

These findings highlight the importance of adopting a well-structured policy on dental students attendance in the theater by every dental department, which should specify the role of theater in dental education, the role of academic teachers and students, and the appropriate surgical procedures that constitute their operating theater experience. Students should be stimulated to prepare for theater sessions, which could help reduce their intimidation in the theater.[8] Furthermore, the use of additional resources such as, interactive e-learning,[19] or video-conferencing[9] when resources allow was recommended by some authors, which can contribute to the teaching experience.

Another important dimension in exploring our student's experience in the theater was to examine its potential influence on their future career choice. Students with theater-based learning experience perceived better understanding of the resident duties in the theater, and were more familiar with the hospital surgical environment. They showed more interest to consider surgery for their postgraduate education compared to their colleagues, although the 2 groups showed no differences in their interest in surgery before joining the dental program. Evidence suggests that early surgical exposure is believed to be critical for attracting student interest in careers in surgery.[18] Although the response rate was relatively low from graduates of 2005-2006, and differences in students' perception of the various competencies were less significant when each academic was considered separately compared to the total sample groups (which could be attributed, at least in part to the small sample size for each year independently), we believe that our sample was representative, with no significant differences between the 2 examined groups in terms of gender, grade in Oral Surgery, interest in surgery prior to joining the dental school, which allowed the comparison, and the detection of differences. However, subjects who were engaged in postgraduate training programs were excluded, and those might have benefited from their theater experience. Furthermore, students' choice to attend theater was optional. These 2 factors create a limitation to our study.

Our results indicated that although the objectives of theater-based teaching were not particularly clear in our department, dental students believed that attending theater sessions was challenging and important for their oral surgery education. Active involvement on dental students' part can thereby lead to better integration and better learning.[8] It is also believed to provide a good basis for future professional development.[20]

In conclusion, theater-based learning is perceived by undergraduate dental students as a valid interactive educational tool for oral surgery teaching, which helps teaching surgeons to move away from passive teaching styles toward an active learning environment. Active involvement and integration on dental students' part can thereby lead to a superior educational experience and promote for postgraduate surgical programs, however, further studies are required to develop the role of theater in dental education, likewise, to specify the role of academic teachers and students in theater experience.

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Illustrations, Figures, Photographs

Four copies of all figures or photographs should be included with the submitted manuscript. Figures submitted electronically should be in JPEG or TIFF format with a 300 dpi minimum resolution and in grayscale or CMYK (not RGB). Printed submissions should be on high-contrast glossy paper, and must be unmounted and untrimmed, with a preferred size between 4 x 5 inches and 5 x 7 inches (10 x 13 cm and 13 x 18 cm). The figure number, name of first author and an arrow indicating "top" should be typed on a gummed label and affixed to the back of each illustration. If arrows are used these should appear in a different color to the background color. Titles and detailed explanations belong in the legends, which should be submitted on a separate sheet, and not on the illustrations themselves. Written informed consent for publication must accompany any photograph in which the subject can be identified. Written copyright permission, from the publishers, must accompany any illustration that has been previously published. Photographs will be accepted at the discretion of the Editorial Board.

Apendix A - Questionnaire items representing skills and competencies of the questionnaire.

1	I am able to describe the surgical approach and operative procedures related to orthognathic surgery
2	I am able to describe surgical approach and operative procedures related to TMJ surgery
3	I am able to describe to describe the surgical approach and operative procedures related to dental implants
4	I am able to describe surgical approach and operative procedures related to management of odontogenic tumors
5	I am able to describe surgical approach and operative procedures related to dento-alveolar surgery (e.g. wisdom teeth extraction)
6	I have adequate knowledge of the anatomy of the maxillofacial region
7	I am familiar with all instruments related to oral surgery
8	I understand the standard theater etiquette and protocols
9	I am aware of the role of the various theater personnel
10	I am aware of the importance working together with other medical teams (e.g. Anesthetists, ENT, head and neck surgeons and others)
11	I am aware of the potential complications of surgery
12	Can you cope with the emotional impact of surgery at work
13	Do you feel competent in dealing with complications after oral surgical procedures?
14	I do appreciate the need for careful peri-operative patient monitoring.
15	Are you aware of the surgical resident duties in the operating theater?
16	Are you aware of the surgical resident duties regarding pre and post-surgical patient care?
17	I can scrub-up adequately
18	I can adhere to sterile procedures during surgery
19	I am aware of the risks involved in theater to myself and others
20	I am aware of the risks involved in theatre to patients
21	I am able to assist in surgery (as second assistant)
22	Are you familiar with the surgical environment in hospital?
23	Do you find it easy to approach the surgical team to ask for attendance to surgery?
24	Do you think you would choose oral surgery as a future career provided that the opportunity was available?
25	Did you have inclinations to surgery before dental school?

Appendix B - Questionnaire items for students with theater-based learning experience.

1	Do you think that attending the operating theater is important for oral surgery education?
2	Do you think that theater a challenging place to learn?
3	Do you feel that regular attendance in operating theater necessary?
4	Do you prepare specifically for the operating theater session?
5	Did attending influence your future career choice (with or against the surgical specialty)?
6	Do you find it easy to approach the surgical team to negotiate an active part during surgery?