

Students' Perceptions of Dental Anatomy Course at The University of Jordan

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Abstract

Purpose: The aim of this study was to assess the students' perception of the Dental Anatomy practical module course teaching modalities to evaluate their usefulness and the need for future changes or improvement of the course with the goal of developing the course to meet the needs of the students.

Methods: Students' opinions were sought upon completion of the Tooth Morphology sessions using a questionnaire that probed into their views about different aspects of the course.

Results: The replies to the questionnaire suggest that students were generally satisfied with the course and instructors; they had positive attitudes towards the carving exercise though they had some comments about the quality of material used for tooth carving and the demonstration given in addition to the overall grading

Conclusion: It was concluded that new methods for teaching dental anatomy need to be implemented keeping, at the same time, the old techniques which are important for the development of manual skills. Innovative changes have already been introduced to the course that is hoped to help meet the students' learning needs.

Keywords: Tooth morphology, Dental anatomy, Education and carving.

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Introduction

Dental anatomy is a science focusing on the study of the anatomical and morphological characteristics of human permanent and primary dentition along with their positions and relationships with each other and with the surrounding structures. It is therefore considered a foundational course in the pre-

clinical dental curriculum that is fundamental for establishing a solid dental background and the necessary knowledge to all aspects of dental practice^(1, 2).

As the development of manual skills and the continuous improvement and acquisition of new motor dexterity skills are the basics for dental practice^(3, 4), dental anatomy courses that

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have a tooth carving element begin to develop students' psychomotor skills for restoring teeth to proper form and function at an early stage in the dental curriculum⁽¹⁾. This is done through a combination of two-dimensional drawing projects and exercises to carve teeth from oversized wax blocks^(1,5). In some schools students participate in add-on waxing exercises and have small-group discussion/review sessions with study models of the adult dentition. This methodology has been dropped in some schools due to the increase in student numbers and staffing difficulties.

Dental anatomy presents particular challenges for both students and teachers^(1, 5) being one of the first courses directly related to teeth and oral function. Didactic part of dental morphology in most schools is usually delivered in the traditional lecture form and students' knowledge is tested with written examinations⁽⁶⁾. These traditional teaching methods revealed some weak points that caused frustration for both students and faculty⁽¹⁾. Lectures suffer from the lack of interactive possibilities⁽⁵⁾, and require very little creative thought⁽⁷⁾. Nowadays, computer technologies have been used to enhance and facilitate dental education to augment the traditional didactic information⁽⁸⁾. Students can now use DVDs^(6, 8, 9, 10), and online packages and programs⁽⁷⁾. Virtual reality⁽⁵⁾, and haptic technologies⁽¹⁰⁾. A combination of both online learning with traditional classroom-based learning was found most useful⁽¹¹⁾.

At the University of Jordan, dental anatomy is being taught to first year dental students during the second semester using traditional methods, including didactic lectures, drawing teeth in two dimensions followed by video demonstrations performed by a skilled

professional for carving three dimensional models out of soap blocks, after which the students perform the carving of soap models for selected teeth namely maxillary central incisor, maxillary canine, maxillary and mandibular first premolars, and maxillary and mandibular first molars themselves. Students also have two tooth identification sessions where they bring a variety of extracted teeth and identify them both individually and in groups with the help of the instructors to conclude the practical dental anatomy course. Knowledge is tested with a combination of a written examination in the form of MCQ exam, a carving and a tooth identification practical examination⁽⁶⁾. By the end of the course students are expected to be able to describe and draw root and crown contours, identify and differentiate each type of tooth, reproduce acceptable tooth contours, and communicate with the instructors, peers using standard terminology and sketches when appropriate.

Despite having its own limitations, evaluating students' own perceptions of their learning is currently regarded as the most pragmatic indicator of a program's success and as a substantial part of the development of any educational resource⁽⁵⁾. Therefore, the purpose of this study was to seek out the opinions of first year dental students at the University of Jordan regarding the usefulness of the carving sessions they took in familiarizing them with dental anatomy and helping them develop their manual dexterity skills, in addition to their overall impressions on the course and suggestions for improving it.

Methods

This research was reviewed by the Board of the Faculty of Dentistry and the Ethics

Committee at the University of Jordan and a formal exemption for the disclosure of data was obtained.

The target of this study was first year dental students at the University of Jordan (UJ) academic year 2012-2013. An anonymous questionnaire was distributed to those students. The questionnaire included two sections; the first section was comprised of fourteen closed questions, whilst the second section was open for students' comments. Closed questions in the first section were modified from a previous study⁽²⁾ and tailored to fit the curriculum at UJ using the psychometric Likert scale to ensure ease of analysis. The second part was open for students' comments. The questionnaire was made anonymous to give the students freedom to write their opinions. The first section included questions about students' opinions regarding the importance of tooth carving for better understanding of tooth morphology, the anatomy of teeth in three dimensions, the role of tooth carving in improving their manual skills, whether they found the carving exercise useful and whether the carving sessions helped familiarizing them with some lab instruments and helped them understand the proper grip of instruments. Questions about the methods of teaching, materials used, teaching venue, supervising staff and their comments, and the evaluation criteria were also included.

As the students usually have little input into the selection of course topics and subject matter included in their dental curricula, and they are usually eager to share their views on the curriculum through their educational experience⁽¹²⁾, the second section was open for students' comments about the course, this section was aimed at providing the students with the opportunity to express their views on

the course. It was hoped that through this part of the questionnaire, students would raise issues in the course that were not noticed by staff members.

The questionnaires were distributed in one of the carving sessions towards the end of the semester by the class representatives and were later collected from those representatives after completion by the students in the absence of the teaching staff.

Descriptive statistics of the questionnaire results were performed using SPSS version 20 (IBM Corp., Armonk, NY).

Results

Answers to closed questions

All first year dental students of the scholastic year 2012-2013 completed the questionnaire with a response rate of 100%. The first part of the questionnaire was completed by all students whereas the second part was filled by (37.6%).

Results of descriptive statistics are included in Table 1. Strongly agree and generally agree percentages were combined together and generally disagree and strongly disagree were combined together for ease of analyses of the results. Some numbers didn't add up to a hundred per cent due to missing data as some students left some questions unanswered.

Students' comments

Only sixty four students out of the one hundred seventy (37.6%) provided their comments. All the comments were focused on praising or criticising the existing teaching methods but none came up with new things like the introduction of new methods or strategies. Most of the students' comments

concentrated on finding the course useful, helpful, and important in reducing the confusion about the shape of teeth and a fun way to learn the anatomy of teeth. Many praised the instructors' knowledge and behaviour, but found their number insufficient

compared to the number of students present in each session. This affected the amount of help and feedback the instructors provided for the students. Some students preferred feedback to be through written comments, and complained about the evaluation as being stringent.

Table 1. Question statements and the percentages of the students' answers to these questions

Question number	statement	Strongly agree+ generally agree	Neither agree nor disagree	Generally disagree + strongly disagree
1	The carving exercise helped me better understand tooth morphology	88.2%	8.8%	4%
2	The carving sessions helped me understand the anatomy of teeth in three dimensions	85.3%	10%	4.1%
3	The carving sessions helped me developed my manual dexterity	67%	22.4%	8.2%
4	The carving sessions helped me familiarize with some of the lab instruments	71.8%	18.2%	8.8%
5	The carving sessions helped me understand the proper grip of instruments	73.6%	18.8%	5.3%
6	The material used (soap blocks) was easy to handle	30%	21.8%	46.5%
7	The laboratory space provided was ideal for performing the tasks	64.7%	18.8%	14.7%
8	I think an online demonstration of the process of carving a tooth would have been helpful	80%	10%	8.8%
9	The supervising staff members were helpful in the carving sessions	80.6%	10.6%	6.5%
10	The marking criteria for tooth models are realistic	68.8%	21.2%	8.8%
11	The comments that markers provided were useful	69.4%	18.2%	11.2%
12	I found the carving sessions waste of time	20.6%	20.6%	57.7%
13	I do not think the carving sessions added anything to my knowledge of tooth morphology	22.4%	6.5%	68.8%
14	All in all I found the carving exercises very useful	77.6%	11.2%	7.1%

Students also were dissatisfied with the quality of the material used in tooth carving (soap) and described it as being brittle and causing allergic reactions. Many students found the duration of the sessions short and insufficient to complete the tasks required.

As for comments on teaching methods in the laboratory, a few students thought that the videos used in teaching were unclear, though many others found them very valuable if used in addition to live demonstrations. Many students asked for the videos to be made available for them at home to be used while

practicing outside lab hours. Some students thought that carving the real size of teeth would be more useful as the four times magnification of the soap models caused confusion. Furthermore, few students suggested that moving the practical module to another semester would be more useful.

Discussion

The aim of educational research is to revise, evaluate and try to improve teaching⁽⁹⁾. The current dental anatomy course has been taught at the University of Jordan in its present format for the past ten years. It was therefore felt that a change needed to be made to catch up with the development in education both locally and internationally.

Although the first part of the questionnaire was filled by all students, the second part which was open for students' comments was answered only by (37.6%), this low response may be either because students felt that the first part covered all issues of concern to them, or they were hesitant in writing their own comments as it needed more thinking and effort. Additionally, some students prefer not write down their views to avoid compromising their anonymity.

Advances in information and communication technology continually offer innovations to assist faculties in their efforts to help students learn new information or develop new skills⁽⁹⁾. It was found that students learn equally well by traditional and new methods but prefer e-learning⁽⁶⁾. This was reflected in our study, as 80% of the students expressed a desire to incorporate online demonstrations into the course.

The practical component of a dental anatomy course begins to develop students' psychomotor skills for restoring teeth to proper

form and function. Students are usually eager to learn the content of this course. Our students found the course interesting, useful and a fun way to learning dental anatomy, it improved their knowledge about the anatomy of teeth and their manual skills.

Teaching the practical course of dental anatomy at UJ follows the traditional means of learning psychomotor skills through "bench-type" exercises, including creating line drawings and sculpting teeth out of soap blocks using carving instruments^(1,5). However, Line drawing exercises have several limitations, most significantly the challenge of portraying three dimensional relationships of tooth morphology in a two dimensional drawing. Furthermore, carving teeth that differ significantly from actual size can be a very difficult task with a questionable value in terms of the skills that are fostered⁽¹⁾. This was reflected in some of the students' comments who found carving over-sized teeth confusing and suggested carving teeth of same size as natural teeth. It is believed that for this very early learning stage in the dental course, using large models can help the students better visualize the morphology of the dentition⁽¹³⁾. On the other hand, carving real sized teeth might be practically difficult as the students might not have enough manual skills to do so⁽¹⁴⁾. Therefore, it is the authors' intention to introduce add-on waxing exercises to restore missing morphology of natural sized teeth and integrate it with the existing teaching methods starting this academic year. The course will then be reevaluated and replacing soap carving in the coming years will be considered if the outcomes are favourable.

In a survey of dental students in 2006, it was reported that students found demonstrations and observational learning critical to their education⁽¹⁵⁾. Watching another

practitioner perform treatment can be incredibly didactic⁽¹⁶⁾. Before performing the carving exercise, students at UJ watch a video that was recorded by the course instructors showing step by step carving of the tooth. Although a live demonstration was used previously, it had to be substituted with videos due to the increasing number of students. This decision was made because live demonstrations were already believed and shown to provide students with an inadequate field of view which is an issue for any procedure that students are attempting to learn⁽¹⁷⁾. Some students found the videos unclear and requested live demonstrations. Raising the quality of the videos shown to the students, and making them available for the students to watch at all times will certainly improve the students' experience. Furthermore, increasing the staff/student ratio will enable the re-introduction of live demonstrations in addition to the video demonstrations.

The predominant approach to the assessment of students' work at UJ remains tutor led. Effective evaluation can provide valuable information regarding the teaching process, which ultimately contribute to improving the success of both students and teaching modules⁽¹²⁾. In the second part of the questionnaire some students asked for written feedback on their performance and clearer standards for grading. This might contribute significantly to novice students' attainment of a new skill⁽¹⁸⁾. Based on this it is the intention of the authors to add a rubric of grading for each task performed by the students in the laboratory. It is believed that this can help the students recognize their own starting point,

their current limitations, and help them identify and achieve their aspirations⁽¹⁹⁾.

The results of this survey suggest that the carving exercises should be continued as part of the dental anatomy course. However, new teaching techniques and materials have to be introduced to the course to meet all the evolving needs of dental students. Like the introduction of computer based learning modalities⁽⁵⁾.

It is important to emphasize that this was a pilot study involving only one year. It is therefore imperative to follow up the same students during clinical years to validate the findings, and to seek the opinions of first year students during the upcoming academic years, following the introduction of new e-learning methods, marking criteria and assessment tools and the reintroduction of live demonstrations.

CONCLUSIONS

This questionnaire revealed that students are positive about their carving exercise in the dental anatomy course. Furthermore, the results suggest that thoughtful integration of e-learning into the curriculum is required and may be best if combined with lectures, some classroom activities or seminars. Additionally, students' opinions revealed the need for some modifications in the course to enhance their learning experience. This includes incorporation of more elaborate feedback, increase number of supervising staff and developing self-assessment skills.

After reviewing the course and based on the students' views, the authors have already started introducing innovations into the course to match the students' learning needs.

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رأي الطلاب في مادة تشريح الأسنان العملي في الجامعة الأردنية

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الملخص

تهدف هذه الدراسة إلى معرفة رأي الطلاب في مادة تشريح الأسنان العملي في الجامعة الأردنية، وذلك لتقييم فاعلية طرق التدريس الحالية وتحديد الحاجة لإحداث تغييرات في تدريس المادة بما يتناسب مع حاجة الطلاب. تم أخذ آراء طلاب السنة الأولى في طب الأسنان بعد إكمال مادة تشريح الأسنان الوصفي النظري والعملي بواسطة استعمال استبيان هادفٍ لجمع آراء الطلاب عن نواحي مختلفة من المادة بالإضافة إلى إعطائهم الفرصة لإبداء آرائهم وتعليقاتهم عن المادة. وقد استجاب ١٠٠٪ من الطلاب استجابوا للاستبيان. وأظهرت نتائج الاستبانة أن الطلاب بشكل عام كانوا راضين عن أسلوب تدريس المادة والمدرسين وبينوا أن تجربتهم الدراسية للمادة كانت إيجابية، وأن أهداف المادة بإعطاء فكرة للطلاب عن تشريح الأسنان قد تم تحقيقها. كما كشف الاستبانة أن أبرز مشاكل الطلاب في المادة كانت تتعلق بنوع المادة المستعملة في حفر الأسنان، وطرق ووسائل التوضيح في المادة العملية بالإضافة إلى نظام التقييم والعلامات بشكل عام. وبناءً على هذه الدراسة، تبينت الحاجة إلى استخدام طرق جديدة في التدريس لهذه المادة في الجامعة الأردنية بشكل عام، وبشكل أخص استخدام طرق توضيحية جديدة ومبتكرة ونظام علامات شامل. وأوضحت نتائج الدراسة أيضاً أهمية طرق التدريس الحالية في نظر الطلاب، بالأخص حفر الأسنان المستخدم حالياً، في توعية الطلاب بتشريح الأسنان وتطوير مهاراتهم العملية.

الكلمات الدالة: تشريح الأسنان، التعلم، النحت.