The 42\textsuperscript{nd} Annual ADEE Scientific Meeting

Science and the competent dentist an inter-professional perspective

Faculty of Dentistry - University of Barcelona
August 24\textsuperscript{th} to 26\textsuperscript{th} 2016
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Introduction to Abstracts Section

Professor Deborah White, ADEE Editor

With over 42 years of continuously being delivered the ADEE annual scientific meeting continues to be one of the most popular Dental Education meetings on the dental academics calendar. This fact being reinforced by the large volume of abstract entries received for our 2016 meeting in Barcelona. With almost 200 submissions over four streams, submissions in 2016 was one of the highest we have experienced in many years.

The following pages detail the abstracts selected under the heading of Selected Oral presentations, Topic Related Oral Presentations and Poster Presentations subdivided into a number of presentation themes.

This year’s Topic Related Presentations cover a broad range of topics related to our meeting theme of Science and the Competent Dentist. At this session we will hear presentations on; a Collaborative Inter-Professional Electronic Health Record; Antimicrobial Prescribing Patterns of dentists in the UK; 25 years of the basic science within ADEE; and the use of an online video library to support the development of clinical skills.

Our Selected Oral Presentations area also diverse offering insight into; student basic psychological needs satisfaction and the role of feedback in self-determined motivation; the impact of 3d versus 2d ibooks; the efficacy and student’s perception of the use of a numeric tool in conventional course; and GO-Period an update on the 2015/2016 ADEE Futudent scholarship.

Given the large volume of posters that will be on display and to assist you navigate the posters on display we have categorised them into the following themes:

- Assessment (24 posters)
- Communication (8 posters)
- Competence (5 posters)
- Curriculum (22 posters)
- Evaluation (31 posters)
- Faculty Development (5 posters)
- Inter-professional education (6 posters)
- Teaching Methods (21 posters)
- Technology Enhanced Learning (23 posters)

In closing, I must acknowledge the enormous task of the local scientific committee in the abstract evaluation process led by Professor Cristina Manzanares. I must too acknowledge in advance the efforts of the volunteers who will assist in the poster evaluation process and selection of best poster award.

With over 140 academic posters on view we are confident that you will find much to talk about and learn from each other at Barcelona.
Selected Oral Presentations

Friday 26th August 2016
BVG Auditorium Access on 3rd Floor
11:30 to 12:30
The Mediating Role of Basic Psychological Needs Satisfaction between Quality-Quantity of Feedback and Self-determined Motivation in Dental Education

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Aim: Self-determination theory (SDT) postulates that teachers’ constructive feedback, when mediated by students’ perception of their basic psychological needs satisfaction (BPNS) of feeling autonomous, competent and related to significant others, is associated with increased levels of self-determined motivation. Therefore, our aim is to test the mediating role of BPNS between quality-quantity of feedback and motivation, in a dental student sample.

Materials and Methods: We conducted a cross-sectional study collecting data on demographics, quality-quantity of feedback, perception of BPNS, and motivation, from 929 Chilean undergraduate dental students. Mediation of BPNS was tested based on the Preacher & Hayes approach and then integrated in a structured equation model, controlling for gender, age, and year of curriculum.

Results: There was a significant indirect effect of quality-quantity of feedback on self-determined motivation through BPNS ($b = 0.111$, $p = 0.004$, BCaCI [0.039, 0.197]), representing a small but significant effect-size ($K^2 = 0.021$, BCaCI [0.007, 0.038]). The final model (Quality-quantity of feedback $\rightarrow$ BPNS $\rightarrow$ Motivation [Controls]) fitted well the data and all regression weights reflected positive associations, with a stronger significant indirect path and a weaker non-significant direct path.

Conclusions: Teachers’ quality-quantity of feedback affects self-determined motivation of dental students through the mediating effect of BPNS. Consequently, it is not the intended effect of teachers’ feedback that impacts motivation, instead it is the influence it has on students’ perception of BPNS that will, in turn, have a positive or negative effect on their motivation.

This is the first study to test the mediating role of BPNS between feedback and dental students’ motivation. For dental education, constructive feedback that facilitates BPNS could lead students to engage and value academic activities, which is expected to contribute towards them becoming better practitioners and, therefore, to increasing patient-safety. Therefore, the BPNS of autonomy, competence and relatedness should be considered when planning interventions to increase dental students’ self-determined motivation.
Selected Oral Presentation No 2: Friday 26\textsuperscript{th} August 11:45

The impact of 3D versus 2D iBooks

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Aim: The primary aim of this study was to compare dental students’ evaluation of two iBooks (delivered using Apple iPads) addressing the anatomy of the temporomandibular joint (TMJ) and the masticatory system: one using 3D visual interactive elements and the other one using a series of 2D images representing the same structures. The secondary aim was to explore users’ perceptions in order to determine if there are benefits associated with 3D.

Materials and Methods: A mixed method was used. First year dental students from the University of Dundee were invited to this study. The first stage was a randomised control group comparison using a pre-test/post-test method. Scores from the pre-test/post-test were collected as well as the time each participant spent using the resource. While the second stage was a focus group, where data was collected by means of an audio record.

Results: Twenty-seven students took part in the study, thirteen used the 2D iBook and fourteen used the 3D iBook. Mean score was 10.5 +/- 3.0 SD out of 19 points. Results for pre-test/post-test for each group were: 2D iBook: 9.2 +/- 3.3 SD and 9.7 +/- 3.3 SD, 3D iBook: 8.4 +/- 3.4 SD and 11.2 +/- 2.5 SD. A two by two-way factorial ANOVA test showed a significant interaction between pre-test/post-test and the 2D and 3D learning method (p<0.05). The mean time per group students used the iPads were: 2D: 21 minutes; 3D: 29 minutes. The correlation between time spent and score improvement was non-significant. Framework analysis of the focus group data showed students were highly motivated and felt more confident with their responses when using the 3D learning resource.

Conclusions: 3D learning resources can be a valuable and effective resource for studying the TMJ and the masticatory system and are capable of enhancing motivation and confidence in junior dental students.
Selected Oral Presentation No 3:  
Friday 26th August 12:00

Student’s perception and efficacy of smartphone use in magistral curse : a pilot study.

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Aim: Many authors suggest that student attention decline during magistral lecture. This may cause lack of participation and decrease knowledge acquisition. The aim of this pilot study is to evaluate the efficacy and student’s perception of the use of a numeric tool in conventional curse.

Materials and Methods: We used a quasi-experimental method based on post-test questionnaire and interview. The studied population was the 5th years dental student of Toulouse Dental Faculty, france. One group (40 students, control group) received a conventional pediatric dentistry lecture and the other (40 students, test group) the same curse using the Socrative® numeric tool to answer several questions along the session. Both of the groups sited for a final examination. A group of 10 participants (5 of each group) was recruited to conduct semi-directive interview in order to let them share their opinion on the two methods.

We used a mixed method for data analysis: A quantitative analysis was provide to evaluate knowledge acquisition and overall student’s perception, using the R® software. A qualitative analysis, using the Nvivo® software, was conduct on recorded interview transcript to reveal thematic perception.

Results: Comparisons by the Wilcoxon rank sum test between the two groups did not reveal significant difference, for the perception questionnaire and evaluation result, but it show a positive general pattern (p = 0.17). However, thematic analysis reveal that dental student get bored and do not desire to participate in conventional class. The use of real time, smartphone-based questioning help them to stay focused and to share opinion with their classmate.

Conclusions: In this limited pilot study during a pediatric dentistry lecture, the use of Smartphone do not make a significant increase in knowledge acquisition among dental student. But the student perception of this numeric tool is mainly positive. In particular, this is a useful method to encourage them to participate.
The GoPerio project – An update on the 2015/2016 ADEE Futudent scholarship


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Aim: Based on personalized videos and cloud services, GoPerio is a novel model for oral hygiene education in the dental practice. It aims at increasing patient compliance with simple psychological interventions and adopts modern technologies to ensure efficiency and ease of use. The rationale, specifics, and ambitions of this model will be presented.

The design of an upcoming randomized controlled trial will be unveiled and discussed.

Materials and Methods: The architecture behind GoPerio is based on a scientific literature review. By combining the principles of motivational interviewing and the use of personalized videos, patients are motivated and instructed for oral hygiene. A text message platform is used to send recalls to patients to reach durable compliance and reduce the need for patient-dentist encounters. Via a cloud platform, the patient accesses his source of personalized and clinician-approved information.

A pilot randomized controlled trial was designed and seeks to demonstrate the superiority of this novel approach over traditional patient instruction. It follows the guidelines of the Cochrane Collaboration for the evaluation of one-to-one oral hygiene advice in a dental setting.

Results: Direct clinical measures (plaque control, bleeding on probing) will be collected by blind and calibrated observers. Questionnaires for satisfaction, perception, and behavioural change will be answered by patients. Preliminary steps (operators training, observers’ calibration, longitudinal observation, cross-sectional study) led to refine the study design and allowed its scheduling.

A thorough statistical analysis will allow a sharper understanding of compliance-related factors and success-predicting signals.

Conclusions: GoPerio sounds a promising solution for an easy, digital-powered and reliable oral hygiene education. Its superiority over traditional methods must be demonstrated by the means of a robust multicentre randomized controlled trial. To pave the way, a pilot study was designed and scheduled. Additionally, the opportunities and difficulties of the creation of a clinical research project as a dental student will be evoked.
Topic Related Oral Presentations

Friday 26th August 2016
BVG Auditorium Access on 3rd Floor
12:30 to 13:30

Science and the competent dentist: an inter-professional perspective
Improving Health through a Collaborative Inter-Professional Electronic Health Record

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Aim: Health professionals struggle to decrease the 17-year “bench-to-bedside” gap between knowledge discovery and its general application to personal health. A collaboration of three US dental schools (Michigan, Pittsburgh and North Carolina), Internet2 (US) and ICE Health Systems (Canada) are working to reduce that gap to 17 months through the creation of a cloud-based electronic health record (EHR) and data warehousing function first for dental schools and dental practitioners, and then extending it to incorporate patient information from all health specialties.

Materials and Methods: This innovative EHR has five goals: (1) Enable collaboration among professionals using the service connecting clinicians to clinicians, clinicians to researcher, researcher to researchers. (3) Reduce costs by allowing users to do more with less. While committing to enhanced and consistent performance, cloud technology eliminates the need for servers and server support and significantly reduces software costs. (2) Provide convenient access to your EHR. Cloud technology means that you can access your account information directly and securely from any device with a browser. (4) Increase patient access. Patients can view their records at all times for emergencies or consultations with clinicians anywhere in the world. (5) Ensure security of systems and processes. Internet2 works closely with ICE to ensure compliance with the Cloud Control Matrix security guidelines, thus ensuring a high level of system and process security. University of Michigan has also conducted an extensive audit of ICE’s security posture.

Results: The result is an innovative collaboration between the cloud EHR service provider ICE Health Systems, the three dental schools, and Internet2.

Conclusions: This is the first time a service provider has collaborated with dental schools to develop an EHR that focuses on supporting the patient care, education and research missions of academic dentistry with the long-term goal of improving patient outcomes first in oral health, and then in all of health.
Antimicrobial Prescribing Patterns of Dentists in Wales, UK

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Aim: The aim of this study was to report the current prescribing practice of general dental practitioners (GDPs) in Wales as part of a UK-based educational programme encouraging the most effective clinical use of antimicrobials in general dental practice.

Materials and Methods: All practices registered with the Wales Deanery, UK (approximately 496) were invited to take part. Participants anonymously recorded information via an online portal on consecutive patients prescribed antimicrobials: diagnosis, reason(s) for prescribing, additional intervention(s) carried out, and any other relevant information. The name of antimicrobial prescribed, along with the dosage, frequency, duration of therapy was also recorded. Data were collected from 20 patients or for a period of 3 months, whichever was achieved first.

Results: Between April 2012 and March 2015, 279 GDPs from 187 practices submitted records. During the data collection period 5,782 antimicrobials were prescribed in clinical encounters with 5,460 patients - 96% were antibiotics, 3% antifungal agents, 1% antivirals, and 1% other agents with antimicrobial action. Amoxicillin (56%) and metronidazole (31%) were most frequently prescribed. Acute apical abscess, periodontal abscess or pericoronitis accounted for 64.2% of clinical diagnoses associated with antibiotic prescription. 79% of antimicrobials and 69% of antifungals were in line with Scottish Dental Clinical Effectiveness Programme (SDCEP) guidelines. Many patients, prescribed antimicrobials/antifungals, also received local measures (68%/62%); 7% returned for treatment or were referred to a dental care professional. GDPs identified that failure of previous local measures (16%), patient inability to cooperate (7%), patient demand (6%), time pressures (7%), patients’ medical history (6%) may influence their antimicrobial prescribing behaviours.

Conclusions: The findings showed prescribing was not consistently appropriate to the clinical diagnosis and there was deviation from the recognised SDCEP guidelines regarding dose, frequency, and duration of preparations. This emphasises ongoing need to educate dental practitioners making sustainable improvements in their prescribing behaviours, which this study in itself achieved.
Basic Sciences in ADEE - 25 years on, before and after

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Aim: The first ADEE meeting which focussed on basic sciences in dental education was in Budapest in 1990. Since then there have been satellite meetings in Sheffield in 1997 and Antalya in 2011. Special interest groups have figured in the programmes since 2012. The aim of this presentation is to review this progress and assess its future.

Materials and Methods: A literature survey found that perhaps the earliest document on basic sciences in medical education was the Flexner Report on medical education in the USA (1910). From then until the early 1970’s, basic dental sciences were largely allied to medical curricula taught as preclinical disciplines, despite comprising almost a third of the curriculum. Thereafter, basic sciences gradually became established in their own right, and accepted as specific disciplines integral in dental education.

Results: The importance of this divergence was marked initially by ADEE at the 1990 meeting; since then it has grown in importance and recognition by both ADEE and associated bodies. The DENTED project and three Global Congresses further established the field and enabled exchange of information throughout Europe and wider afield. A further milestone was the expansion of basic sciences into the Revised Profile and Competences of the European Dentist (2009) and has culminated with this meeting in Barcelona.

Conclusions: Despite this outstanding progress at a time when basic science has never been of more importance to the graduating dentist, and will underpin future developments in clinical practice and research, it is now under threat. Not only will this lead to less knowledgeable dentists, there will be enormous economic consequences for nations too, as well as impaired dental health and patient care. The role of ADEE in consolidating basic sciences in dental education and realising their importance is now well recognised. Our aim must be for this to continue.
E-learning analytics of videos to support a clinical skills course

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**Aim:** The aim of this paper is to analyze and explore the use of an online video library as part of a Simulation Laboratory course for BDS 4 2015 and 2016 cohorts.

**Materials and Methods:** Over 100 online video clips have been created to support learning outside of the classroom, before, during and after the scheduled teaching sessions. On-line presentations have been created which include: screen captured power point presentations, skills preparations, clinical case consultations and worksheet debriefings. Data Files from the Learning Management System were obtained and data BDS 4 from the class of 2015 and 2016 were analyzed. An evaluation questionnaire was performed on the 2015 cohort. A Psychometric for surface and deep approach to learning SPQ-2F (Biggs et al) was administered (IRB approval UW – 15-346)

**Results:** In total 4689 videos were accessed by the two classes, 35% by class of 2015 and 65% by 2016. 73% of these were watched during the Sim Lab course period, 13% were watched 2-3 weeks before exams, 22% 1 week before Key Skills and 14% during the remainder of the year. The 3 most watched categories of videos were: instructional psychomotor skills and case consultation videos. The top 25% of video consuming students watched 50% of the videos, and the bottom 25% watched only 9% of the videos. Feedback on the learning resources were absolute. 100% of students reported the videos helped: their learning, preparation for the Simulation Laboratory classes, refresh their memory prior to clinical care and preparation for Key Skills. Over 90% reported these helped them prepare for exams, allowed revision of the in-class worksheets.

**Conclusions:** These videos were reported to significantly support student learning and were valued by the class. However, there are significant differences between student consumption.
Poster Presentations: Assessment
Title: Psychometric Development And Evaluation Of The Dental Undergraduates Preparedness Assessment Scale (DU-PAS)

Author: *Ali Kamran¹, Slade Anita², Kay E³, Tredwin Chris⁴

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Aim: The aim of this study was to develop a valid and reliable scale to measure preparedness of new dental graduates.

Materials and Methods: The scale development and validation was done using Rasch analysis, a single-trait Item Response Theory model. Following pretesting of the scale and a pilot, a national study was undertaken with undergraduate students from all dental schools as well as foundation dentists in UK.

Results: The psychometric properties of the scale were assessed using Rasch analysis. External validity of the scale was checked through validation with a range of stakeholders. An excellent fit to the Rasch model provided evidence of internal construct validity. The scale demonstrated invariance, ordered thresholds and lack of differential item functioning. Unidimensionality of the scale was confirmed by independent t-tests. Reliability of the scale was confirmed by a high person separation index and Cronbach’s alpha. Test retest reliability of the scale was also established.

Conclusions: The preparedness scale developed in this project reflects pioneering research using a systematic approach and employment of modern psychometric methods. The scale can be used for assessment of the preparedness of undergraduate students by dental educators and potential employers as well as by the student for self-assessment.
Poster Presentation

Poster Title: Feedback on Individual Clinical Formative Assessment to improve the oral hygiene teaching

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Background: The teaching of clinical skills is challenging. The practical works in pre-clinical years are useful to improve the learning of clinical procedures such as the dental scaling and root planning. However, the skills to practice anamnesis, treatment plan explanation or therapeutic education, as oral hygiene instruction are more challenging to teach. In our clinic, we have tested a new approach to improve the oral hygiene teaching of 3rd and 4th year dental students. Each student is evaluated in a session using an assessment grid in three parts (communication, knowledge, clinical interpretation). The evaluator is neutral and given after the session a personalized feedback to the student.

Aims: Our objective is to evaluate if dental students feel that the Formative Individual Clinical Assessment of oral hygiene teaching improves their skills in oral hygiene teaching.

Mat and Met: 57 students 3 and 4-years dental students have received an anonymous survey in six points to evaluate the benefit of the Individual Clinical Assessment and the consequence on their knowledge and on their expertise in communication.

Results: 52% (n=30) students have answered the survey. 76% reported a positive experience and found that the Individual Clinical Assessment has improved their knowledge (43,3%). However, for half of this panel of students, this session has not improved their skills in communication and their ability to practice the oral hygiene teaching. The distribution of the answers did not vary depending on the study year.

Discussion/Perspective: The Individual Clinical Assessment is a very long assessment method and is not attractive if it only allows improved knowledge. We propose two perspectives. First, to realize a demonstration of oral hygiene teaching in little groups of students before to start the clinical assessment sessions. In the second, we propose to film each student during this session. The movie will be used to work the feedback with the student.
Title: Influence of methods of teaching endodontology on students’ self-efficacy and self-perceived competence.

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¹² Endodontology, Academic Centre for Dentistry Amsterdam, Amsterdam, Netherlands

Aim: At graduation, many dentists feel underprepared for performing endodontic treatment. We assessed whether self-efficacy and the self-perceived competence of students who are about to graduate had been influenced by methods of teaching endodontology.

Materials and Methods: Methods of teaching endodontology at our institution* were revised. Changes concerned: the increased number of tutorials, the method of clinical training, the method of summative assessment, the number of endodontic treatments required, and the supervision while performing endodontic treatment on patients. An intermediate cohort (N=91) comprised students attending all or some of the former methods and students attending all or some of the current methods of teaching. Twenty-four students participated; their self-efficacy and self-perceived competence were assessed close to graduation with a questionnaire. Additionally, their performance in carrying out endodontic treatments was assessed according to predetermined criteria. Data were analysed using Cronbach’s Alpha, Cohen’s Kappa, Mann-Whitney and T-tests.

Results: Neither students’ performance in carrying out endodontic treatments, nor the method of clinical training, nor the method of summative assessment did influence their self-efficacy (respectively p=0.375, p=0.828 and p=0.751) or self-perceived competence (respectively p=0.372, p=0.702 and p=0.533 ). The current - higher - number of tutorials increased students’ self-perceived competence (p=0.028), but did not influence their self-efficacy (p=0.413). Not the entire number, but the number of endodontic treatments performed under supervision of endodontists revealed an increase in students’ self-efficacy (p=0.034) and self-perceived competence (p=0.022).

Conclusions: Among the teaching methods only the number of tutorials and the number of endodontic treatments performed under supervision of endodontists influenced students’ self-efficacy or their self-perceived competence.
Poster Presentation

Poster Title: Multiple choice test shows that the weaker dental students are overconfident regarding self-assessment

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Background: When launching the Faculty’s new master’s degree curriculum in dentistry (“Oslo 2013”) an interdisciplinary multiple choice question (MCQ) test was introduced. The multiple choice tests are carried out in each clinical semester (semester 5 through 10). Students have to pass the test in order to advance to the next semester. The questions correspond with the learning outcomes of the respective semesters. The objective of the multiple choice test is to facilitate a more stable learning process for students and to ensure a minimum level of knowledge during exams at the end of each semester.

Aim: The aim of this study was to evaluate the student’s self-perceived level of knowledge compared to the actual score in the multiple choice test.

Materials and Methods: Questions for the test are submitted by the faculty departments. Each department submits eight questions with four possible answers per question for each semester, whereof only one answer is correct. The questions correspond with the learning outcomes of the respective semesters. The questions are registered in “Fronter”, a digital learning platform. Students can take the test repeatedly over a period of two weeks, approximately at mid-semester. The students answer an appraisal form, regarding their level of confidence related to the actual test score.

Results: Student response rates to the appraisal form for semesters 5 through 7 were between 58 and 62 %, however only 36.2 % in semester 8. Student responses in the appraisal form show that weaker students were overly critical regarding the assessment of their MCQ test score when taking the MCQ test for the first time in semester 5. By semester eight, and after a prolonged period of multiple choice testing, responses by weaker students suggest that they developed a more realistic awareness of their level of knowledge in the different subject areas.

Conclusions: Results must be interpreted with care due to the low response rate in semester eight. Multiple choice testing seems to improve weaker students’ abilities of self-assessment.
Poster Presentation

**Poster Title:** Assesment Of Learning Within A Competency-Based Curriculum At The Faculty Of Dentistry Of The University Of Chile

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**Background:** The Faculty of Dentistry has implemented a competency-based curriculum which reorganizes training into Student Work Units (SWE) so as to achieve the profile required for graduating. Each one of the SWEs has involved a combined effort by teachers of basic, pre-clinical and clinical sciences, who selected the competencies and sub-competencies, as well as the methodologies for teaching and strategies for evaluating each SWE. The goal is to present the methodology used to assess the development of competencies at the different levels of training, so as to establish programs for improvement.

**Aims:** 1) Establish at what given moments students’ learning will be assessed. 2) Use an active, participative methodology to design the assessment. 3) Define the assessment strategy that will report on the achievement of competencies and sub-competencies by means of the learning results for each SWE.

**Materials and Methods:** First, key milestones within the curricular itinerary are identified. Next competencies and sub-competencies are selected, in addition to the learning results from first and second-level SWEs. Work is performed with teachers per level, using an active methodology. Subsequently, the most complex results are defined and assessed, and finally the most appropriate assessment strategy is defined.

**Results:** Assessment will be performed per educational cycle: basic, pre-clinical, and clinical. In 2015, 20 SWEs corresponding to the career’s first and second levels will be assessed. Work is performed with teachers from the first and second levels, with whom learning results are defined.

**Conclusions:** The assessment strategy used corresponds to clinical cases, which is the strategy that is most used in these courses, and audios are included with these cases as a means to complement information provided to the students. Guidelines and rubrics are developed jointly, and are included in the implementation of the assessment.
Poster Presentation

Poster Title: Can the Admissions Multiple Mini-Interview Predict Academic Performance?

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¹Department of Paediatric Dentistry, The University of Edinburgh Dental Institute, Edinburgh, United Kingdom

Aim: To assess the association between candidate performance at admissions multiple mini-interview and subsequent achievement at summative assessment within a graduate-entry dental school.

Materials and Methods: Ethical approval was granted from the College Ethics Research Board. Data for students enrolled on a graduate-entry dental course between September 2008 and June 2014 were captured as follows: (1) the overall, multiple mini-interview score (MMI), (2) individual MMI scores/station and (3) all first-attempt summative assessments for class- and degree examinations during this time period reported as the University Common Assessment Scale (CAS). Data were analysed by multiple linear regression and Pearson correlation (IBM® SPSS® Statistics 21).

Results: Data were obtained for 95 students (F: 59; M: 36). MMI scores demonstrated a correlation with CAS scores (r² = 0.184, P = 0.001). MMI which assessed manual dexterity and previous work experience demonstrated a predictive value in subsequent summative assessments (r² = 0.173 and r² = 0.195, both P = 0.001).

Conclusions: This study suggests that the MMI might be a predictor of academic achievement for graduate-entry dental students with certain stations demonstrating a greater predictive value.
Poster Presentation

Poster Title: Evaluation Of The Pre-Pilot Assessment Process For Successful Completion Dental Foundation Training In The Uk

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Aim: To evaluate the pre-pilot processes involved in ensuring satisfactory completion of Dental Foundation Training (DFT) in the UK.

Materials and Methods: Following graduation, a 1-year of DFT is mandatory for UK dental graduates wishing to work in NHS primary care dental practice. DFT (previously Vocational Training) has been running in the UK for many years but no formal assessment has been used except in Scotland. This new process looks to formalise assessment over the training year. Six out of the 12 areas took part in the pre-pilot and the authors reviewed the processes and the outcomes achieved. Data collected from Review of Competency Progression (RCP), anonymised completed paperwork, an online survey and direct feedback, was analysed and a report produced.

Results: The RCP process was new but built on established processes. The evaluation highlighted areas of good practise and overall the authors found the process fair and transparent. Some variation was noted in different areas and the need for National consistency was highlighted. Agreement on the core skills to be assessed along with structured training aimed at standardising processes of assessment and data collection is essential. An excellent guide (Blue Guide) improved transparency of the process. A significant proportion of the data collected related to work based assessments (WBAs) similar to those used in medicine and specialty dentistry. The evaluation noted concern that the majority of these WBAs were undertaken by 1 individual unlike in secondary care where multiple assessors are used.

Conclusions: DFT successful completion is a high-stakes assessment so requires to be valid and reliable. WBAs are a valid, well recognised assessment approach. However, as the majority of the assessment decisions are made by a single trainer, appropriate training needs to be provided and a robust triangulation model established.
Title: Utilising a 3D-Scanner to assess preclinical dental students’ crown preparations – time efficiency and information transfer

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Aim: CAD/CAM systems were introduced in dental education to visualize crown preparations and to assess their quality. Besides the possibility to objectively measure preparation features like tooth reduction or taper, these systems facilitate self-directed learning and assessment. However, their use is limited by high investment costs and the time needed to scan, process and assess the preparations at the work station. It was the aim of this study to determine and optimize the duration of each process step using the preparation validation system “Dental Teacher” (KaVo Dental GmbH, Biberach, Germany) in preclinical dental education.

Materials and Methods: Thirty students of the preclinical prosthodontic course in the fifth semester at Kiel University participated voluntarily. Groups of 5-7 students prepared posterior and anterior teeth. After subjectively finishing their preparation, they got a short introduction how to scan the teeth and how to work with the software to assess the preparation by comparing it to the original tooth and a given master preparation.

Results: The mandatory processing steps (log-in, choice of task, scanning the preparation, matching the different data sets) took about 3 to 4 minutes, with the most variability in the matching process. Visualizing and assessing the preparation (e.g. rotation of the three-dimensional view, different cross sections, distance measurement) took another 3-5 minutes at the work station. To transfer the information to the simulation unit a new process was established: Significant parts of the assessment process were recorded by the students using a screen capture video software (Snagit®, TechSmith, Okemos, USA) and the resulting mp4.file of approximately one minute was immediately send via email to their smartphones.

Conclusions: When using a video capture program to transfer information to the student’s smartphone, time at the workstation could be reduced to 8 to 10 minutes, enabling approximately seven students per hour to use the 3D-preparation assessment system.
Title: Development and Introduction of a Diagnosis and Treatment Planning Assessment for Year 4 Undergraduate Dental Students at Peninsula Dental School, UK.

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Aim: The introduction of a five-year curriculum at Peninsula Dental School has provided the opportunity to introduce a ‘Diagnosis and Treatment Planning Assessment’ (DTPA) that must be successfully completed to allow progression to the final year of the course.

The aims of this poster are to detail the rationale for this assessment and explain the methods chosen to deliver and standard set this assessment. An example case is presented.

Materials and Methods: The DTPA is an Objective Structured Clinical Examination (OSCE) that is a single simulated station with all the necessary information provided but no patient/actor. The DTPA aims to test whether a student can interpret a history, clinical and radiographic data and then synthesise this information to produce a written diagnosis and treatment plan.

A full history, clinical charting, photographs, radiographs and results of diagnostic tests from a real but anonymised patient will be provided. Students have 60 minutes to analyse the information and arrive at appropriate diagnoses and a treatment plan, documenting their findings on a response sheet.

Results: In order to set the pass mark, seven judges familiar with the Angoff method of standard setting will be recruited from the academic team. All judges will be asked to complete the assessment at the level of a minimally competent student. The Angoff method is most appropriate as other methods, such as the Borderline-Group Method, have been ruled out by not having examiners directly observing candidates’ performance.

Conclusions: The first opportunity to trial the assessment and collect preliminary data will be when it is run as mock examination in February 2017. This assessment, combined with the treatment planning workshop and lectures that constitute part of the module, should lead to improvements in the diagnosis and treatment planning skills of our dental students, preparing them for well for their final year and independent practice once qualified.
Poster Presentation       Theme: Assessment No 10

Title: How Marking Schemes And Examiners Skew Assessment Outcomes

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Aim: The aim of this project was to explore the impact of a marking scheme and examiner assignment of scores on summative assessment in a UK dental school using a mixed methods approach.

Materials and Methods: As educational assessment incorporates both score scales and professional judgement a mixed methods approach was used to collect both quantitative and qualitative data. The un-transformed and linearly transformed scores were compared at each stage of the score aggregation to determine any impact on the score and grade assignment. Think-aloud interviews of examiners were used to gain insight into how examiners set about marking essays and assigning scores.

Results: We found that there was a significant (paired t-test, p<0.01) skewing effect resulting in misclassification of candidate achievement by 1 or 2 grade categories. We also found that the practice of capping scores of failed candidates further skewed the outcomes resulting in rank changes. Think-aloud interviews revealed differing interpretations of assessment corresponding to individual examiner practices which were also contributing to skewing of scores. Common to all examiners was the tendency primarily to rank essays (norm-referencing) rather than primarily to adhere to criterion-referencing. Whether examiners mark holistically or analytically, essay presented a problem to inexperienced examiners who needed more guidance and were reluctant to make negative judgements.

Conclusions: The researchers argue the following:

1. If score aggregation is to be employed in assessment, the mathematics underpinning the calculation need to be modified to minimise skewing of scores
2. Or, aggregation needs to be avoided across independent components of an assessment and replaced by assessment design that requires examiner decisions about quality based on criteria rather than percentage scores.
Poster Presentation       Theme: Assessment No 11

Poster Title:  Introducing A Review Of Competency Progression Assessment Model In Uk Dental Foundation Training

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Aim: To describe the development and introduction of a Review of Competency Progression (RCP) assessment model in UK Dental Foundation (DF) Training.

Materials and Methods: Following graduation in the UK, a 1-year of DF Training is mandatory to enable the UK graduate to work independently in a NHS dental practice. DF training (previously Vocational Training) has been running for many years but no formal assessment has been used (except in Scotland) to ensure satisfactory completion. The introduction of RCP looks to formalise assessment.

DFT is currently defined only as a period of employment and, whilst assessments take place there has been no definition of ‘satisfactory’ completion. The Committee of Postgraduate Dental Deans and Directors (COPDEND) set up a project to build on existing assessment arrangements to develop a formal satisfactory completion model. The project is led by Malcolm Smith, Postgraduate Dental Dean for HEE North East Local Office and managed by Charlotte Carr. A decision was taken to develop a model based on the established ARCP process already used in medicine and specialty dentistry, adapted for a one-year programme. This new model, (RCP) introduces Panels to consider evidence and documentation provided by the Foundation Dentist to make a judgement about whether or not training is progressing in a satisfactory manner (month 6) and has been satisfactory completed (month 10).

Six LETBs participated in a pre-pilot of RCP during the training year 2014/15. Documentation, processes and outcomes were tested locally and scrutinised by an academic external review resulting in a report and recommendations.

Results: Following the pre-pilot, amendments were made to the process, the most significant being the development of national panel training; an e-portfolio and further development to the DFT guide.

Poster Presentation

Title: Exploring uses of the UK Clinical Aptitude Test, situational judgement test in a dental student selection process.

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Aim: In 2013 the UKCAT included a non-cognitive situational judgement test in addition to the four cognitive subtests commonly used by UK dental schools to select students. However, little is known about the situational judgement test’s psychometric properties and relationship to other selection tools. This study’s aim was to explore these issues to inform decisions about the inclusion of the UKCAT SJT in the dental student selection process.

Materials and Methods: The sample comprised a cohort of applicants to a Bachelor of Dental Surgery programme, at a UK dental school, which does not use achievement in the UKCAT SJT in its selection process. The impact on applicant outcomes of two theoretical uses of the UKCAT SJT was examined. Firstly, SJT Band was used as the criterion for offers of a place instead of the school’s admission interview, and secondly, weighted UKCAT scores, including a weighted SJT Band score, were ranked to make interview invitation decisions. Associations between SJT Band, UKCAT cognitive scores, interview score and performance in first year assessments were examined.

Results: If SJT Band 1 & 2 were used as the criterion for an offer of a place, some applicants rejected by this school’s interview, including ‘red flagged’ applicants, would have received an offer of a place. Using a weighted UKCAT/SJT system for invitation for interview decisions increased the mean total UKCAT cognitive score of those invited for interview but included applicants rejected by this school’s structured interview, including ‘red flagged’ applicants. Neither usage disadvantaged underrepresented groups. SJT band correlated with UKCAT score (n= 228, rs = -0.38, p<0.01) with interview score (n = 186, rs = -0.17, p<0.05) but not with first year study assessments.

Conclusions: This study has shown that use of the UKCAT SJT in the dental student selection process is not supported by robust validity evidence.
Poster Presentation

Theme: Assessment No 13

Poster Title: Relationship between the way of admission and graduation on time in a Catalan dental school

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Background: In the public dental school of Catalonia, Spain, the criteria to select the most qualified applicants is based only on the prior academic performance. The applicants normally gained admission through one of three ways: from secondary school and university entrance exams (UEE), from higher vocational training studies (HVTS), or from other ways (foreign studies, +25 years-old...). For the last 7 years the number of students who came from HVTS increased considerably, reaching a similar percentage of students as those who came from UEE.

Aim: The aim of this preliminary study was to determine the relationship between the way of admission and graduation on time.

Materials and Methods: Data from students who initiated their graduate in 2009 or 2010 were reviewed. Participants were excluded if they entered without pre-registration, if they cancelled the registration fees during the first academic year, or if they dropped out having most of the subjects passed. The outcome variables were graduation on time and the Weighted Average Mark (WAP) as the average score of all mandatory courses weighted by their number of European Credits Transfer system (ECTS).

Results: Two-hundred and sixty-five initiated in 2009 or 2010 and 45 were excluded. Among students who entered via UEE, 105 (73.4%) graduated on time, whereas only 29 (44.6%) of students who entered via HVTS graduated on time. However, the WAP’s were not different between those who entered via UEE and those who entered via HVTS (P>0.05, One-way ANOVA, Duncan post-hoc test).

Conclusions: With the limitations of this study, it seems that students who come from UEE have more chances of achieving graduation on time than those who come from HVTS. However, their WAP’s are similar.
**Poster Presentation**  
**Theme: Assessment No 14**

**Poster Title:** The role and effect of perceived domain importance in dental student selection involving the multiple mini interview.

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**Aim:** In 2011 only Cardiff dental school used multiple mini interviews (MMI) as a tool to assist in the selection of dental students. In 2016 MMIs were used in the selection of dental students by 10 of the 15 UK universities offering dentistry degrees. This research highlights a method for determining station importance and detail the value of and influence that weighting station domain has in the MMI.

**Materials and Methods:** Following the screening and scoring of over 700 applications to study dentistry at Cardiff, a 10 station MMI covering a number of domains (logic, creativity, breaking bad news, giving instructions, receiving instructions, reasoning, manual dexterity, critical thinking, data interpretation and English comprehension) was arranged for 237 shortlisted applicants. The perceived importance of each station domain was graded on a Likert scale by 65 staff involved in the 2016 MMI using an electronic response recording system (TurningPointTM) and the responses used to determine the weighted scores for the stations. The weighted scores were used to adjust the raw station marks (previously factorised and adjusted to score a maximum of 1 at each station) in order to determine whether or not an offer to study at Cardiff was made.

**Results:** Station weightings ranged from 0.95 (manual dexterity) to 0.67 (English comprehension). There was no significant differences (p = 0.104 to 0.978) in perceived importance of station domains between dentists (n=37) or non-dentists (n=28) involved in the MMI process. The influence of weighted scores on the acceptance or rejection of an applicant was observed to be most notable at the grade boundary (score = 0.48) for acceptance or rejection.

**Conclusions:** The value of weighting station domains by interviewers cannot be underestimated both in the overall outcome of the MMI and of the interviewers’ perceived ownership of the process as a whole.
Title: Assessment of dental undergraduate, dental hygiene and therapy students' GRIT scores.

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Aim: Grit is a non-cognitive personality trait defined as passion and perseverance for long-term goals. Grit has been shown to be a predictor of success and retention in academics and careers. This study aims to measure grit of undergraduate dentistry, dental hygiene and dental therapy students at Cardiff University in order to identify low and high grit groups and effectively focus teaching support, to promote long term success of students and develop resilience.

Materials and Methods: This was a cross sectional study. Anonymous 8-item grit scale questionnaires were distributed to all undergraduate dentistry, dental hygiene and dental therapy students; 357 students participated. High (+1SD) and low (-1SD) grit demographic groups were identified. Cardiff University Dental Hospital Ethics Committee has approved this study.

Results: There were comparable proportions of high and low grit students found between the dentistry, dental hygiene and dental therapy courses. Significant proportion of first year dental, dental hygiene and dental therapy students and female students were found to be high in grit (+1SD). Larger proportion of final year students, male students and students between 31-37 years of age were found to be low in grit (-1SD). There was a moderate negative correlation ($r_s = -0.31 \ p < 0.01$) between progression through the course and grit scores of students.

Conclusions: First year students have been shown to have significant grit and should be given opportunities and praise for their goal-oriented mind-set. As students progress further through their education, more teaching support should be made available particularly to those identified with low grit scores, in order to maintain and nurture resilience in them and enhance their long-term success.
Title: Students’ And Mentors’ Perceptions Of Discussion As A Tool For Assessment Of Reflection In Orthodontic Postgraduates

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Aim: To describe and investigate a three-component strategy, introduced to a postgraduate orthodontic program, to assess reflection and its outcomes.

Materials and Methods: Nine first-year students and seven mentors underwent the strategy, based on a reflective portfolio and participants discussion for one year. Students’ and mentors’ perceptions were collected using focus groups and individual interviews respectively in order to describe students’ and mentors’ attitudes towards assessment of reflection. The data was analysed using thematic analysis.

Results: Categories emerged. Assessment of reflection: Both students and mentors were not confidant and expressed doubts in the value of the assessment of reflection at the beginning of the experience. Then it became clear and more accepted that this assessment evaluates both the process and the outcomes of reflection. Summative assessment: The success of the summative assessment of reflection depends on: the continuos nature of assessment, the simple and well defined criteria, the presence of a calibration process, the number and role of mentors. Formative assessment: Students reflect more easily, more frequently and more deeply during the experience. Discussion with peers and with the mentor were considered facilitating factors for reflection improvement over time. Assessment of reflective writing and discussion: reflective writing should be the starting point for assessment of students’ reflective skills but discussion with the mentor should be considered the best way to allow evaluation of outcomes of reflection.

Conclusions: Students and mentors considered the strategy an effective tool for assessment of reflection. On the basis of their perceptions, reflective writing in the portfolio can be used for assessment of the reflective process but the discussion with mentors and peers are better tools for formative and summative assessment of the outcomes of reflection.
Poster Title: How does self-assessment correlate with clinical assessment in clinical dental education?

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Aim: Self-assessment is an important part of learning. In that way it is possible to evaluate the success of education and students can realize their strengths and weaknesses, as well as gain goals for themselves in future profession. The aim of this study was to compare the self-assessment to clinical assessment in different disciplines.

Materials and Methods: In clinical dental education in University of Oulu, Finland, the structural assessment based on the assessment criteria of Cowpe et al. (2010) has been used both in clinical assessment and in self-assessment in 3rd to 5th year of dental studies. Material consisted of 145 dental students (84 women and 61 men). Clinical skills of the students were assessed by clinical teachers in clinical disciplines and dental nurses. In assessment the used items were insufficient (=1), sufficient (=2), basic (=3), advanced (=4) or excellent (=5).

Results: The correlation was found throughout the years of dental studies. At 3rd year of studies the statistically significant correlation was found in oral surgery (p=0.000), orthodontics (p=0.014), TMD therapy (p=0.018), and outpatient clinic (p=0.040). After 4th year there was correlation in addition to 3rd year in periodontology (p=0.000), restorative dentistry (p=0.001) and endodontics (p=0.012). After 5th years of studies the correlation was found in all disciplines.

Conclusions: It can be concluded that the ability to self-assessment develop during the clinical dental education along with experience in clinical practice and chair-side teaching.
Title: Correlation between the use of keypads and degrees of certainty in a theoretical test

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Aim: The teaching model of the Faculty of Dentistry of the University of Chile currently is focus in the student, emphasizing autonomy in their ability to take decisions. Within this framework, the teacher’s team of the Orthodontic's area has focused on improving teaching and delivery of content with the use of new technologies, such as:

- Theoretical evaluations with degrees of certainty
- Keypads (Turning Technologies)

The purpose of this research is to evaluate the correlation of these two tools in a theoretical test and decide their performance, used together, to improve the delivery and evaluation of contents.

Materials and Methods: The sample corresponds to fifth year students from Dentistry in "Orthodontic 1" 2015 (undergraduate) (N = 102 students).

The first theoretical test (30 multiple-choice questions with evaluation of degrees of certainty) was performed, once it was completed, immediately was organized the revision of the test using keypads.

Each student had keypads, once the question was projected they had 3 minutes to indicate their choice.

Results: Two questions illustrated very well the objective of this study:

1. The first had a high degree of success (92%) and a high degree of certainty in its response, then we can conclude that both, the content and the questions, were properly developed.

2. All the opposite was observed in the second question, where the answer had 2 different alternatives with the same percentage of choice, which coincides with the high degree of insecurity on the answer.

Conclusions: In conclusion, the use of both pedagogical tools not only helps to determine whether the test was developed correctly, but also allows to incorporate the necessary information from students for future corrections in the test development or modify the content delivery.
**Poster Presentation**

**Theme:** Assessment No 19

**Poster Title:** The possibilities for improving manual dexterity skills of dental students in the basic module of dental education

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**Aim:** The aim of the research is to assess and improve the dental students’ skills immediately after the entrance examination, as well as the neurological (MRI) follow-up of the changes.

**Materials and Methods:** Altogether 30 first-year dental students were examined (15 were tested, 15 students are in the control group). (average age: 20.8 years; male/female ratio 9/21)

The development course that consists of ten occasions was preceded by the Ham-Man test of manual dexterity. The measurement was completed by MRI scan and handwriting analysis.

With neuroimaging (MRI) voxel-based morphometry (VBM) technique was used to measure the changes in brain plasticity.

The development course included drawing, wax carving and clay modelling. The practices involved activities that can be connected to dentistry (drawing and carving teeth), however, the training about the morphology of teeth was avoided on purpose.

**Results:** Certain results show correlation with the students’ skills development, for instance, the scores of the Ham-Man wire bending test prove the effectivity of the development course. In the graphology analysis manual dexterity was one of the aspects that was evaluated, and it correlates with the other tests. The MRI images have shown that the size of some brain areas has correlation with dexterity.

**Conclusions:** The entrance examination of the Hungarian dental schools do not include aptitude tests, which can be disadvantageous for some students. The manual dexterity skills development in the first year would help the students to raise their skills to the expected level of the preclinical module.

A manual dexterity test preceding the entrance examination would improve the scientific quality of all fields of dental education.
Title: Which MMIs are the best predictor of academic performance and clinical aptitude for applicants to a graduate entry dental degree?

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Aim: The aim of this study is to determine which specific Multiple Mini Interview (MMI) stations are the best predictors of future academic performance and manual dexterity.

Materials and Methods: Ethical approval will be required. The University has been assessing applicants using MMIs since 2009.

10 MMI stations are used to assess the following domains: teamwork, core qualities of a dental practitioner, communication skills, review and assessment of a research article, previous work experience, commitment to University geographical area and manual dexterity.

It is proposed to correlate the scores achieved by students at individual stations with their academic performance recorded on the University common grading scale (CGS) at the end of years 1 and 2.

Comparisons will also made between scores in the manual dexterity MMI stations and the number of attempts taken to reach the required clinical standard as measured through clinical skills assessments in the clinical skills laboratory.

The results will be subjected to appropriate statistical analysis.

Results: Results will be used to develop the selection process by identifying the best and worst predicting MMI stations. This would suggest enhancing or weighting the best performing stations and removing the worst. Furthermore, it is hoped to show whether manual dexterity stations accurately predict competence in clinical skills assessments, and if there is a baseline manual dexterity score below which students consistently struggle to achieve a safe standard of clinical competence.

Conclusions: This research will help to guide the admissions process so that universities are able to select applicants who have the potential to perform academically and clinically to the highest standard.
Title: Evaluation of multiple-choice questions one through immediate feedback on fifth year students of Dentistry. Universidad de Chile.

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Aim: The purpose of this study is to evaluate if students understand what is asked them through the review of the assessed contest and answers.

Materials and Methods: The sample consisted of students in the fifth year of the subject of "Orthodontics 1" 2015 (undergraduate) (N = 102 students).

Once completed the test (30 multiple choice questions), review it was organized keypads.

Each student had a keyboard and had three minutes to respond. Once all marked participants did response immediately was discussed with the teaching staff to results. If the answers were not correct, this situation was discussed. If the majority of students answered wrong, the conclusion was that the question was badly formulated it, and was eliminated of the test and in the following test, this question have chance again.

Results: Two of the questions were removed and reformulated because two alternatives were 50% for each one of two alternatives.

Conclusions: The academic team, at a meeting of experts considered very useful this immediate feedback in front of students.
Aim: The term assessment derives from the Latin “assidere” meaning to sit beside, suggesting that the assessor and the student travel together side by side on the journey to learn. Training the competent dentist requires evaluation against a series of standards. Our aim was to gather together current evidence for tools used for these two processes of assessment and evaluation as part of curriculum planning which, in turn, enhances the learning and development of successful dentists.

Summary of work: Methods used to assess the dental undergraduate and postgraduate were considered. A review of the literature included dental student, tutor and patient perceptions and evidence for the validity, reliability, educational impact, acceptability and cost of assessment methods.

Summary of results: A guide to dental assessment was developed based on the literature review and utilising a successful format already adopted in veterinary medicine. The guidebook includes a short summary describing each assessment method and considerations for both new and experienced dental educators at the undergraduate and postgraduate levels.

Discussion: Synthesising the literature in an accessible format for colleagues aims to support staff development and on-going modernisation of assessment.

Conclusion: There is a body of evidence to support the use of a wide range of assessment methods although some score more highly in the utility equation than others.

Take home messages: This guide aims to promote the use of appropriate assessment methods within undergraduate and postgraduate dental education and is freely available online.


Title: Efficiency of a prepCheck-supported self-assessment concept in preclinical simulation environment.

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Aim: The present study aimed to evaluate the educational outcome of a previously implemented, digitally based self-assessment concept (prepCheck; Sirona, Salzburg, Austria) for preclinical undergraduates in the framework of the regular phantom-lab course.

Materials and Methods: A sample of 47 third-year dental students participated in the phantom-lab course, and was randomly divided into prepCheck-supervised (self-assessment) intervention (IG; n=24) and conventionally supervised control groups (CG; n=23). During the preparation of macroretentive three-surface class-II cavities (mod), each IG participant could use the opportunity to analyze a superimposed 3D image of their cavity and the ‘master preparation’ by means of the prepCheck-application. In the CG the assessment of the preparations was performed by three (plus one) course instructors using predefined assessment criteria. After completing the course curriculum, the mandatory (blinded) practical examination was provided for all participants (IG and CG), which included the preparation of the identical mod-cavity. Then, CEREC-Omnicam optical impressions were taken to digitalize all preparations, followed by assessing the cavities using the prepCheck-application. During this procedure the predefined assessment criteria were reapplied using the respective distance measuring tools, available as a part of the software.

Results: The statistical analysis of the digitalized samples (Mann-Whitney-U test) revealed no significant difference between the cavity dimensions achieved in the IG and CG (p=0.406). Additionally, the sum score of the degree of conformity with the ‘master preparation’ (maximum permissible 10% of plus or minus deviation) was also comparable in both groups (p=0.259).

Conclusions: The implemented interactive digitally based self-assessment for undergraduates seems to be qualitatively equivalent to the conventional form of supervision.
Title: A structured review of the use of work-based assessments as summative assessments of Fitness to Practice in dentistry.

Author: O’Brien T

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Aim: The aim was to review the evidence for the validity of Work-based assessments (WBA’s) when used to make high stakes judgments, such as on a practitioner’s Fitness to Practice, within dentistry.

Materials and Methods: Electronic searching of 10 databases was performed, in order to identify papers discussing the use of WBA’s within dentistry.

The titles and abstracts were reviewed. In order to be necessary for inclusion, the paper needed to have been published in English, and to refer to the use of WBA’s in dentistry or have a title that did not specifically indicate that it related purely to medicine or veterinary medicine.

Only papers whose full text version could be obtained through Shibboleth (Plymouth University) or Athens were included.

Results: 1004 results were obtained; following review at title/abstract level and full text, and removal of duplicates, 19 papers were included for review. Validation of these assessments involves accumulating relevant evidence to provide a sound scientific basis for the proposed score interpretations. It is the interpretations of test scores for proposed uses that are evaluated, not the test itself. WBA’s are context specific; statements about validity should refer to particular interpretations for specified uses, they are not a property of the test itself. Papers describing the general principles behind work-based assessments and evidence supporting their validity in various dental educational contexts were identified, but none specifically described the validity in terms of a reliability coefficient. There was a general consensus that these assessments were valid when used in undergraduate and postgraduate training. No papers were identified that provided evidence of validity of work-based assessments for high stakes/Fitness to practice judgments within dentistry.

Conclusions: This highlights the need for evidence for validity of these assessments in high stakes assessments of dental practitioners performance if their results are to be relied upon for Fitness to Practice purposes.
Poster Presentations: Communication
Poster Presentation | Theme: Communication No 1

Poster Title: Evaluating dental residents’ non-verbal communication during the objective structured clinical examination

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Aim: This study aimed to assess the impact of dental students’ NVC on interview evaluations by standardized patients (SPs).

Materials and Methods: A total of 53 medical interviews in an objective structured clinical examination (OSCE) for dental residents were analyzed. All interviews were videotaped and evaluated on 10 nonverbal behavior items. In addition, the quality of the interview content was rated by dental clinical instructors on 12 items and the interview was rated by SPs on 4 items. The relationships between residents NVC and SP evaluation were examined by multivariate regression analyses controlling for the quality of the interview content.

Results: Almost all residents amount of gaze toward the patient below the 50%, look at patient equally when talking and listening. Standardised patients were likely to give higher ratings when resident talked to them with adequately facial movements and expressions, used facilitative nodding when listening to their talk. These effects of NVC remained significant after controlling for the quality of the interview content.

Conclusions: This study provided evidence of specific non-verbal behaviors of dentists that may have additional impacts on the patient’s perception, independently of the interview content. Education in basic NVC should be incorporated into dental education alongside verbal communication.
Poster Presentation  Theme: Communication No 2

Poster Title:  Dental students on social media: how does the guidance work?

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Aim:  To identify and explore themes within the General Dental Council’s (GDC) Guidance on using social media which may be problematic for dental students.

Materials and Methods:  The GDC Guidance on using social media was reviewed. Four main areas were identified as potential sources of problems for dental students. These areas were explored with reference to other studies exploring health care students’ use of social media.

Results:  The four main areas identified were: confidentiality; communicating with patients; personal versus professional use, and education. Whilst patient confidentiality is an essential part of being a dental professional there are some grey areas on social media. There are case reports in the literature giving examples of health care students inadvertently breaching confidentiality, for example by sharing information about a rare medical presentation in a small community, with the result that the patient could be identified. There are many ways dental students can communicate with patients on social media. How to manage friend requests from patients and control of social media privacy settings may be issues encountered by dental students. There is controversy throughout the literature about management of personal versus professional use of social media. In studies of health care students, freedom of speech is regularly cited as a reason not to restrict social media use. The Guidance recognises that social media can be a useful educational tool but there are studies that suggest dental students may not want it to be used for this purpose.

Conclusions:  Further research is required to assess how dental students should manage problems they encounter on social media. The points of view of the patients, the profession, the students themselves and the institutions to which the students are affiliated also require consideration. How educators can use social media most effectively to support dental students’ education would also benefit from further investigation and research.
Title: Utilisation of dental services and oral hygiene habits of primary school children in Dar es Salaam and Morogoro, Tanzania.

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Aim: In August 2015, the European Dental Students’ Association began an outreach programme in Tanzania named the Pamoja Programme. Prior to the visit, Morogoro was highlighted as an area of treatment need where an oral health initiative was previously introduced by the Finnish Ministry of Health. The study aimed to determine the oral hygiene practices of primary school children in Dar es Salaam and Morogoro and the prevalence of untreated dental pain in these two regions.

Materials and Methods: A systematic sample of standards one and four primary school children in Dar es Salaam and Morogoro was included. The 660 participating children were selected from three schools in each region. A questionnaire, presented as an spoken interview in Swahili collected data investigating the children’s dental history and behaviours relating to oral health care. The questions were taken from WHO Oral Health Survey Basic Methods, 5th Edition and independently translated.

Results: The results showed few differences between the urban city, Dar es Salaam and Morogoro. In both areas, 97% of children said they had used toothpaste in the past 3 months. Children in more rural Morogoro however were more likely to routinely use novel dentifrices, notably salt or charcoal. The presence of toothache was higher in Dar es Salaam with 57% of children reporting toothache on at least one occasion in the last month. Despite this, 50% had never visited or a seen a dentist in their lifetime. 49% of the children in Morogoro reported toothache in the past month with 55% of respondents having been to the dentist at least once before.

Conclusions: Both regions demonstrated treatment need. Urban Dar es Salaam had a greater prevalence of dental pain and lower utilisation of dental services. The investigation outcome is that the association intends to continue the outreach and commits to a 5 year Tanzanian programme.
Poster Presentation  Theme: Communication No 4

Poster Title: “A patient who viewed my social media profile would question my professionalism”: An analysis of dental student attitudes towards professionalism online and self-reported online behaviours.

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Aim: Online content can generate professional and ethical challenges for healthcare professionals. The aim of this study was to explore the relationship between student attitudes towards online behaviours and self-reported online behaviours.

Materials and Methods: Cross-sectional study using a convenience sample of dental students across three years of study in a single dental school. Questionnaires were developed in advance of the study. Data were collected anonymously with paper-based questionnaires over a two month timeframe. Descriptive analysis was undertaken in SPSS.

Results: 155 responses were received (90% response rate). The majority of students n=131 (84%) were confident that a patient would not question their professionalism if they looked at their social media profile; 10% (n= 16) of respondents felt patients would question their professionalism if they saw their online content. The majority of students who felt that patients would question their professionalism were identified online by real name on at least one platform. Over half of these students had identified themselves online as University students and as dental students; many had at least one publicly accessible profile. Most of the students in the study reported that they intended to review, edit or delete their social media profile content once they qualified.

Conclusions: The majority of students intended to alter their online profile upon qualification. This suggests that most students did not feel that their online image and content was suitable for a qualified dentist. A small number of students reported that they were aware that their online content was professionally inappropriate but had evidently chosen not to make alterations, despite the risks to their professional reputation and career. This study suggests that further work is needed to investigate dental student perceptions of professional content and risk-taking behaviours in relation to social media.
Poster Presentation

Theme: Communication No 5

Title: Concepts in critical thinking applied to developing a model for Interprofessional Education

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Aim: Interprofessional education and practice are the future in health care yet educational outcomes and assessments have not yet been reported. The future will depend on each member of the health care team being able to integrate the main perspectives of other members in planning care for the patient. This is an initial critical thinking model using concepts from the education literature to emulate the intended activity with the thought process being the learning guide, educational outcome, and assessment instrument.

Materials and Methods: The perspectives of each member of the health care team were derived from interviews of senior faculty in respective disciplines. Perspectives were condensed into a learning guide for application in patient planning. Perspectives were for the disciplines of Primary Care Provider, Pharmacy, Nursing, Dentistry, Nutrition, Physical Therapy, Social Work, and Family Caregiver. An example from pharmacy: Patient problems that are drug related. Assessment was objective—did the resident systematically apply each step to the patient—and subjective—did the resident grasp principles as applied to the patient and relate these concepts back to treatment planning. These were first year pediatric dentistry residents (PGY1).

Results: The initial result is a critical thinking skill set understanding the key perspectives of each member of the health team and using the skill set to apply in subsequent patient encounters. Limited data from the pilot showed the residents scored 100% in “applying” each step to the patient and in “grasping” principles. Meaning that the resident systematically applied the perspectives of each team member to a patient in developing the treatment plan.

Conclusions: The model captures the perspective of each team member, serves as a learning guide, and serves as the assessment instrument. It is anticipated that scores will be lower with predoctoral students. Residents agreed this could increase their ability to provide appropriate comprehensive patient care.
Title: How do we define Aggressive Periodontitis? A Systematic Review.

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Aim: To systematically assess the case definitions that set the foundations for teaching aggressive periodontitis to dental students.

Materials and Methods: A systematic review of articles published between 2000 and 2013 on original research in humans, in which ‘aggressive periodontitis’ was used as descriptor. The candidate publications for inclusion were identified through an electronic search in the database MEDLINE using PubMed. All references were appraised in duplicate and disagreement was resolved by discussion and consensus.

Results: The electronic search yielded 833 abstracts and after appraisal 472 publications fulfilled the inclusion criteria. These articles were published in 101 journals, with most articles published in Journal of Periodontology (n=109; 23.1%), Journal of Clinical Periodontology (n=81; 17.2%), and Journal of Periodontal Research (n=54; 11.4%). In 40.5% of the publications the authors explicitly describe the definition used and refer to another article from which the definitions allegedly originate, in 26.5% of the publications only reference to another article is provided without information on operationalization of a case definition. In 12.7% of the publications no information whatsoever is provided as to how the cases of aggressive periodontitis were identified.

It was observed considerable heterogeneity between the approaches used to define aggressive periodontitis in research articles. Substantial variation in the selection of clinical parameters used to identify a case and respective thresholds for the different clinical parameters was found.

Conclusions: We found considerable lack of consensus in the definition of aggressive periodontitis in periodontal research and this may explain difficulties met teaching periodontal classifications and particularly aggressive periodontitis to dental students.
Title: Evaluation of communication skills of dental school students

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Aim: Effective communication is crucial to the dentist-patient relationship. The aim of this study is to investigate communication skills of first and last year dental school students.

Materials and Methods: This descriptive study comprised of first and last year students of Yeditepe University Faculty of Dentistry. Communication Skills Evaluation Scale (CSES) including 25 items questionnaire was used to assess the students’ communication skills. Demographic data such as age, gender and school year were also included in the questionnaire. Dental students voluntarily accept participating in the survey. Statistical analysis was performed.

Results: Totally 91 students (66 female and 25 male) participated in the study. The mean age of students were 21.2. There was no significant difference in students’ communication skills in terms of gender, age and class year.

Conclusions: Although students appear to have some skills, the importance of communication skills should be emphasized more, and efficacious education programs should be prepared.
Poster Presentation  Theme: Communication No 8

Title: Objective and self-perceived communication skills of dental students and dentists. A controlled trial with simulated patients.

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Aim: The aim was to compare the communication skills of dental students and dentists with regard to self-ratings and ratings by tutors and simulated patients.

Materials and Methods: The dental students were above the 3rd year of the curriculum with low working experience. Rated dentists participated in the Master of periodontology program of the University of Freiburg, Germany. Students and dentists filled out a questionnaire regarding their self-perceived quality of dental communication. After that, both groups performed about 20 minutes long conversations with a simulated patient, who was available in four different characters (dental anxiety, non-compliance, smoking patient, and anger). Afterwards, conversations were rated by the tutor using the dental communication questionnaire by Haak et al. (2008) and rated by the simulated patient using the consultation and empathy questionnaire by Mercer et al. (2004).

Results: In total, 70 conversations of 34 students and 36 dentists (with a working experience of 16.1 years in mean) were evaluated. Dentists had significantly higher self-rated communication skills, especially regarding patients with dental anxiety. However, dentists and students showed no differences with regard to the dental communication questionnaire and dental students showed significantly higher skills with regard to the item “patient autonomy” (p<0.033). Both groups highly appreciated the communication training with simulated patients.

Conclusions: Working experience seems not to be associated with better communication skills. Both dental students and dentists are benefiting from communication trainings with simulated patients.
Poster Presentations:
Competence
Poster Presentation

Oral Title: Student self-evaluation in clinical practice

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Aim: An accurate self-evaluation can figure out our strengths and weaknesses, which is very important to improve ourselves. The aim of this study was to assess the ability of the dental students to evaluate their own level in clinical practice.

Materials and Methods: After 16 months of clinical practice, 24 dental students had to score from 0 to 3, their global clinical competences in the following fields: restorative dentistry, endodontics, periodontology, surgery, paediatric dentistry and prosthodontic. Simultaneously, their competences were scored from 0 to 3 by the teachers of these various disciplines. The differences between the two scores were statistically analyzed, by student and by discipline.

Results: There was generally a good agreement between the students’ and the teachers’ score. In case of differences, students tended generally to underestimate their score. The students often overestimated their ability when they had performed more acts. In prosthodontic, no student overrated the score. Their scores could be influenced by the teacher behavior and/or his relation with the student, and by the difficulties encountered with some clinical cases.

Conclusions: Dental students had generally the ability to self-evaluate their clinical competence after 16 months of clinical practice.
Aim: There is a need to develop novel and possibly more effective, interactive and clinical-based learning methods that summarizes the knowledge at the final stage of pre-graduate dental education. The aim of the present study was to evaluate feedback from advanced collating seminars in pre-graduate dental education based on Association for Dental Education in Europe (ADEE) competences set to the European dentist.

Materials and Methods: Dental students (n=21) at the Institute of Dentistry, University of Eastern Finland participated in collating seminars during their 5th study year (last semester). The whole study module consisted of written essays and collating seminars. These five-day seminars included oral presentations, discussion with opponents and teachers and interactive examinations. Essays and oral presentations were prepared as group work, while the examinations using interactive presenter were individual. The students were divided in groups and received written patient cases with structured questions concerning health status, diagnosis and comprehensive treatment plan, brushing up the core substance, including implementation of the treatment and follow-up. After the fifth seminar day, the students were asked (using a questionnaire) how the seminars promoted their learning from 1 (promoted very little) to 5 (promoted very much) according to the domains of ADEE competencies.

Results: The mean values for each of the domains were as followed: Professionalism, ethics and communication 3.5 (SD 0.8), knowledge base and information literacy 3.6 (SD0.7), clinical examination, diagnosis and treatment planning 3.3 (SD 0.8), therapy and maintaining oral health 3.3 (SD 0.8), prevention and oral health promotion 3.3(SD 0.8).

Conclusions: Collating seminars seemed to respond well to the competency set to the European dentist and can be used as a motivating and interactive learning method instead of traditional written essays.
Poster Presentation

Title: The development of novel, ethical and effective teaching to improve basic clinical competencies in local anaesthesia.

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Aim: The delivery of safe, effective local anaesthesia (LA) is a cornerstone of good clinical practise. Undergraduate LA training traditionally involved student-to-student injections. Despite this being widely utilised, there are a number of ethical issues: non-therapeutic use of a drug; obtaining unbiased consent; risk of side effects from the procedure. The aim was to develop a realistic, ethical, simulation for the LA training that can be used as a replacement for student-to-student injections. In particular the inferior alveolar block (IAB) injection. Thiel cadaver embalming offers the potential for such a simulation. Thiel embalming maintains the flexibility of the cadaver compared to conventional formalin fixation.

Materials and Methods: Prior to commencing patient care, students undertook initial LA training involving lectures, seminars and practical simulation – utilising model simulators and the identification of intraoral landmarks. Students self-appraised their knowledge, skills and confidence in the delivery of IABs (using a 1-5 Likert scale). Each student then completed a Thiel practical session. Each session involved students delivering and problem solving numerous simulated IABs on the Theil cadavers. At the end of the session, students completed a post-training self-appraisal and questionnaire.

Results: 136 students appraised their understanding of the anatomical landmarks, positioning, depth of injection and confidence to carry out a supervised IAB on a patient. All parameters showed significant improvements in scores (p<0.0001 – Wilcoxon Signed Ranks Test). The greatest improvements after the Thiel training were in understanding of the depth of injection and confidence (Median scores 2 to 3 and 2 to 4 respectively, p<0.001). 99% of students felt this was a valuable learning experience and 97% felt the exercise facilitated integration of their clinical skills with anatomical knowledge.

Conclusions: Simulation of LA injections on Thiel cadavers is a valuable adjunct to conventional teaching and represents an ethical and effective replacement for student-to-student injections.
Title: Analysis of the educational competences through the following final degree project: “Study of the facial symmetries and its objective and subjective perception

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Aim: To evaluate the management of the educational competences related to investigation in the following final degree project. This paper explores the difference in opinion between three different expert groups in relation to facial symmetry and facial aesthetics after artificially mirroring facial midlines in fifty subjects from Universitat Internacional de Catalunya (UIC), Sant Cugat, Spain.

Materials and Methods: The competences are evaluated, analyzed and applied in the development of the study, which was conducted in UIC. Six standardized facial photographs were taken to each patient with the aim to study his or her facial parameters. Frontal images were mirrored using Esthetic Frame. All patients were alumni of the university, 25 males and 25 females with an age range of 18-30 years old. Feedback was taken from: undergraduate dental students, students from the Aesthetics Masters and teachers from the undergraduate clinics. Upon completion of the study, all images will be destroyed and no longer used for further investigations, protecting patients’ confidentiality.

Results: The investigation related competences are shown during the 5-year long dental studies and are applied in the making of the final degree project.

Conclusions: This competences which have been obtained during the degree, allow us to effectuate this project even though the initial perception was lower than reality.
Title: Clinicians’ Perspectives of Their First Dental Implant Placement Experience – A Pilot Study

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Aim: Dental implants are currently considered as a common treatment for edentulism. The theoretical and clinical training of clinicians performing such procedures varies significantly. The aim of this study was to evaluate the preparation and experience of dentists prior to the placement of their first dental implant. The study furthermore aimed to investigate the pre-operative training of clinicians, the circumstances and environment where the procedure was executed and analyze clinicians’ perceptions.

Materials and Methods: A cross-sectional assessment of clinicians’ first dental implant placement experience was performed using an online questionnaire with bivariate, multiple and open-answer questions. The questionnaire consisted of introduction and consent page, followed by 25 questions grouped into four categories: demographic data, education, first dental implant placement experience and professional guidance. The questionnaire was hosted on Qualtrics online platform of Tufts University, Boston, United States of America, and was distributed through email and social media networks over a period of seven weeks.

Results: As of March 2016, the questionnaire was filled in by 91 clinicians, 23-55 years old (65% males, 35% females) from 24 different countries in Europe, Asia and America. 66% of the participants were qualified for more than 10 years. The most frequent period for placing the first dental implant was 3-5 years after graduation (40%), and 82% of the dentists pursued further training afterwards. Preparations before the first implant case consisted mainly in clinical examinations (85%) and 2D radiographic examinations (67%), and 66% of the procedures received one on one assistance by an instructor. The main difficulties encountered by the clinicians were the identification of the implant position (38%) and performing the osteotomy (44%).

Conclusions: Preparations and conditions for clinicians’ first dental implant procedure vary around the globe. A better understanding of these conditions could lead to improvements in the teaching and practice of implant dentistry.
Poster Presentations: Curriculum
Poster Presentation

Poster Title: Community dentistry outreach program at the University of Zagreb School of Dental Medicine - our first year

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Background: In accordance to EU recommendations, Croatian dental education system has abolished the 12 month internship. Previously, it was obligatory after the graduation and was prerequisite to taking national board exam. Its value was in exposing newly graduated dentists to real-life clinical experience and in increasing the number of performed procedures before being eligible to practise independently.

Aim: The aim was to find the solution to maintain the competence level of young Croatian dentists who are eligible to practise independently in the circumstances without obligatory 12 month internship.

Materials and Methods: We formed new curriculum adding 500 hours of community dental service to our 12th semester. This enendeavour was largely based upon good practices observed from Tromso Dental School (Arctic University Norway), as presented during ADEE Congress (Riga 2014). Zagreb delegation visited Tromso and got familiar with Norwegian experiences in outreach learning. We have performed a selection and education of prospective mentors, designed a set of regulations and requirements, as well as online forms for monitoring the process. Living expenses were secured in cases that students were going outside Zagreb County. The project was funded by the Ministry of regional Development and EU Funds.

Results: We have adopted Norwegian outreach learning practises into our circumstances and formed a large network comprising 94 supervised mentors, who are hosting 94 dental. Our paper discusses statistics of dental procedures performed by students in outreach settings, and reflects the process from three viewpoints: students', mentors' and Dental School administrators'.

Conclusions: Feedback from the 1st year of implementation showed to be extremely favourable, with only one exception of a negligent mentor, and one incident during dental treatment performed by a student. Several improvements on various levels were seen: students learn how general dental practice operates including its management; it provides psychological security; empowers Dental School’s impact on the broader community.
Moral Reasoning Among Dental Students

Aim: Moral reasoning refers to the cognitive process that takes place to judge about right and wrong when facing moral situations. Understanding this process and its influencing factors is very important for educators because one of their major roles is to prepare students for taking the right ethical decisions during academic and clinical life.

This study aimed to assess the level of moral reasoning of 6th year dental students in Makkah Region, Saudi Arabia.

Materials and Methods: Cross-sectional survey was conducted among 267 6TH year dental students in three dental schools in Makkah region using the Socio-moral Reflection Objective Measure (Gibbs & et al.).

The measure is a self-administered questionnaire composed of two hypothetical moral dilemmas with 13 issue statements that matched with Kohlberg’s six-stage moral development system.

SPSS version 21 was used for data entry. Age of participants was represented in mean ± SD while other categorical variables were represented in frequencies and percentages.

Results: A total of 188 (70%) out of 267 students responded to the SROM. Sixty one instruments were excluded according to Gibbs’s standard consistency checks.

The majority of the students scored at the conventional level (stages 3&4). A percentage of 63.8% (n=81) were in stage three (in which right is considered to be the behavior that will maintain approval and secure good relationships), and 35% (n=44) students were in stage 4 (in this stage, individuals show rigid respect to rules).

Conclusions: The assessed level of moral reasoning is considered not satisfactory for students of their age and in higher education, particularly in a health profession specialty.

Being able to make the right ethical decisions in such humanistic careers necessitates individuals’ ability to differentiate themselves from their own interests and their social relations. We would recommend stage 5 of Kohlberg’s moral development system as a learning outcome for graduating dental students.
Title: A Contextual Design Approach to Curriculum Reform... The experience of a Thirty-Year Old Dental School

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Aim: The contemporary move towards competency-based education in healthcare programs, led many dental schools to adopt a standardized set of competency statements. While such an approach set a broad direction for curriculum development, at many instances, it ignores the local context and the specific development needs of the dental school. This might, in turn, minimize “buy-in” of stakeholders, and result in gaps of understanding and application amongst faculty, students, and graduates, and hence, hindering the real efforts for development. Grounded on adult education theory, this multi-phase project aimed at adopting a contextualized approach to reform that addresses the unique development needs of the dental school at King Abdulziz University (KAUFD).

Materials and Methods: Phase I: A comprehensive review was conducted to compare the competency statements around the globe. Trends and unique contextual features were identified. Phase II: A unique set of competency statements were selected to lead the first stage of curriculum development. A competency coverage analysis was conducted by mapping the curriculum against the competency statements to assess the current status. Phase III: The individual disciplinary and integrated needs of the curriculum were identified and addressed. Phase IV: The plans for sustaining and evaluating this curriculum reform are discussed.

Results: Missing elements were identified and areas of redundancy and controversies were located and addressed. Recommendations for developments were shared and discussed with the departments. Sequencing and alignment efforts identified opportunities to plant seeds of vertical and horizontal integration. Elements of behavioral sciences were threaded in the curriculum. This allowed for a smooth trans-disciplinary teaching that is centered on dental diseases, rather than dental disciplines.

Conclusions: This approach allowed for a real and meaningful, context-specific curriculum development. Schools interested in moving from a discipline-based curriculum towards an integrated curriculum need to contemplate a transitional approach that considers the local context and unique needs of the community.
Poster Presentation        Theme: Curriculum No 4

Poster Title: Students Call For A Curriculum Reform - How Students Suggest To Improve The Dental Curriculum

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Background: Dental curriculum should provide the best possible theoretical knowledge and clinical competence for future dentists. At the University of Helsinki, the first two study years focus on biomedical studies and studies are mainly the same for dental and medical students. In their third study year, dental students start three years of intensive clinical studies in the dental unit. In 2015, a curriculum reform was started.

Aims: The aims of this study are to explore (1) how dental students evaluate the current curriculum and (2) how they suggest to improve dental studies. The results of this study are applied in the curriculum reform.

Materials and Methods: The students from 3rd, 4th, and 5th study years were asked to fill in a questionnaire consisting of 16 multiple-choice and open-ended questions on preclinical studies, clinical studies, curriculum content, reaching the intended learning outcomes and methods used for learning and assessment. The response rate was high (N=110, 82% of all students in these study years). The students’ informed consent was requested.

Results: The majority of students suggested for more integration of dental subjects in preclinical studies. As learning methods, students valued clinical procedures and simulations most highly. 71% expressed that simulation was the best way to prepare for clinical work, and 88% suggested to start simulations in preclinical years. Comprehensive and longitudinal dental care of a patient designated to each student was reported as a crucial learning method of clinical studies, although students also reported that patients’ behaviour might be a challenge for them.

Conclusions: This study provided us with evidence that curriculum reform is required. Learning dental knowledge, skills and attitudes need to be incorporated into dental curriculum throughout the study years. Vertical integration is pivotal to support students’ study motivation and their growth of becoming tomorrow’s dentists.
Title: Shifting academically failing or under-performing dental students to succeeding ones

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Affiliations: Peninsula Dental School

Aim: An academic remediation programme for failing and under performing dental students at Peninsula School of Dentistry was introduced in September 2013 and the aim of this study is to evaluate the impact of this intervention.

Materials and Methods: Once academically failing or under performing students at Peninsula School of Dentistry are identified, they are referred in the first place to their academic tutor for study skills advice, but if problems persist, they are referred to the Remediation Lead for a detailed student-centred change management, motivational and coaching interview which focuses on the student’s study skills and wider personal and health issues.

Under performing students are identified as those who pass an academic assessment but pass within 5% of the pass mark and the literature shows that these students often blame exterior factors for the poor grade rather than take responsibility for themselves. This student-centred individualised support promotes effective learning strategies encompassing understanding of memory, contextualisation and active recall of learning, self-organisation, professional learning and time management issues. It helps students understand how to learn best for them and to understand what happens to make this so.

Pre-remediation and post-remediation marks for academic knowledge tests over three years have been evaluated to determine the impact of this enhanced level of support.

Results: During three academic years, a remediation programme has been offered to 95 dental students, although not all these students took up this offer. Of those that did, the average improvement in assessments was 13.5%, with 42.36% being the maximum improvement. This intervention has been successful in shifting failing or under performing students to successful ones.

Conclusions: Student-centred individualised academic remediation has shifted failing and under performing students into successful achieving students, which impacts hugely on students’ well-being and self-esteem. This level of support is time costly but appears to be appropriate and effective.
Poster Presentation

Poster Title: Dental hygiene and preventative management – introduction to the first German undergraduate program in the field of dental hygiene

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Aim: In spite of the increasing prevalence of periodontal diseases there are relatively few qualified personnel in Germany who can assist the dentist during the treatment. Currently, only 850 dental hygienists are working in Germany. The available programs that provide training for dental hygienists are neither accredited nor meet international standards so far. The aim of this contribution is to describe a study program that can both accommodate the increasing demand for highly-skilled personnel and enable students to receive a degree that is officially recognized and internationally comparable in accordance with the Bologna Process.

Materials and Methods: Since 2014, the German praxisHochschule has offered a Bachelor’s Program in "Dental hygiene and preventative management".

Theoretical knowledge is introduced using the instructional method of problem-based learning (PBL): students are directly involved in the development of the course content. Manual dexterity is gained through skill-training sessions, and these skills are eventually practiced during the supervised medical treatment of patients. Students also take part in research projects and have the opportunity to independently promote dental health care practices in retirement homes and children’s nurseries.

Results: The described program is the only Bachelor’s Program currently available at an accredited university in Germany in the field of dental hygiene. To date, about 120 students have enrolled in the program, 50 have already successfully received their Bachelor’s degree. The evaluation results indicate a high level of knowledge transfer. The acquired knowledge can be directly applied in clinical practice.

Conclusions: The educational program “Dental hygiene and preventative management” has been developed as an innovative and successful training program. Graduates receive the proper training to provide essential assistance in a dental practice. Further studies are needed to evaluate the prospective role of the Bachelor’s degree in dental hygiene in the German health care system.
Title: Factors influencing student motivation in a Swedish dental programme with a Problem-based curriculum

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Aim: The aim of this qualitative study was to explore what factors promote or demote dental student’s motivation in a Problem-based learning institution and, thus, gaining insight on strengths and weaknesses of a PBL-curriculum

Materials and Methods: Data was qualitatively collected through focus group interviews. Four focus groups were interviewed: dental students from year 1, dental students from year 3, and dental students from year 5. The forth focus group consisted of faculty members (teachers) so as to compare the perceptions of the students and the faculty teachers.

Results: The results demonstrated student motivation to be a complex and multifactorial matter. Many factors were related to feelings of competence, safety, or meaningfulness of the study of a subject matter, among the students. Factors of significance included relatedness, guidance, constructive feedback, and emotional support from clinical supervisors.

Conclusions: Though the nature of student motivation is a highly complex and multifactorial matter, factors of significant influence for promotion of student’s intrinsic motivation at a PBL institution include relatedness, guidance, feedback and clinical and emotional support from supervisors, among many other factors, several of which provide students with a feelings of security, competence and meaningfulness, thus increasing their interest in the subject matter. Thus, besides tutors and lecturers, clinical supervisors also have a central role in motivating students towards learning. Furthermore, PBL is, indeed, an effective method for teaching undergraduate dental students as well as developing their intrinsic interest in the subject matter and their self-directed learning. However, this requires proper knowledge of PBL by all personnel.
Title: Interprofessional humanities teaching to support the building of capability in clinical dental training. Do students ‘get it’ and does the arts discipline make a difference?

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Aim: Clinical capability in addition to competency requires the development and demonstration of a range of human qualities. The use of humanities teaching in medical education supports outcomes related to these.

The majority of successful humanities courses are voluntary but compulsory elements have been shown to be effective. This student evaluation aimed to:

1. investigate reaction to, understanding and perceived impact of a compulsory humanities course within a clinical curriculum
2. relate views to the specific arts discipline used
3. provide opportunity for students to voice an opinion about these sessions

Materials and Methods: Final year dental students undertake 3 x 3 hour medical humanities sessions; drama (D) (Shakespeare dialogue or improvisation), art (A) (‘art and self’ or life-drawing) or music (M) (making and composing). Small group sessions with a dedicated specialist practitioner culminate in a “showcase” where students perform/display their work to faculty after which they are invited to complete an online surveymonkey© ‘exit poll’.

Results: The response rate was 63%. 95% enjoyed the sessions; 67% understood the relevance to their clinical practice. 76% learned something about themselves (58%), other people (45%), interacting with other people (50%) with 32% learning across all 3 domains. Art discipline impacted on understanding the relevance of the sessions and perceived learning. Free text analysis revealed the majority of students found the sessions stress relieving, fun and a welcome break from the intensity of their dental studies even if they had not initially felt positive about taking part. There were negative feelings about them being compulsory, and a lack of explicit understanding of the purpose.

Conclusions: These compulsory medical humanities sessions were well received and delivered positive outcomes for building capability in clinical students. Clear pre-session information regarding purpose and potential benefits of this pedagogy is required along with explicit engagement of the expert practitioners to ensure optimum gain.
Poster Presentation       Theme: Curriculum No 9

Poster Title:  A feedback training workshop developed in co-production with students: Exploring feedback and student experience

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Aim:  The aim of this study was to explore dental student experiences and feedback arising from a student feedback training workshop developed jointly between students and staff

Materials and Methods:  A feedback training workshop was developed as a joint exercise between dental staff, students and counselling staff.  This was delivered to year 4 dental students by staff and students as a single 2 ½ hour interactive event. The session was not compulsory but those who did attend were given a certificate of attendance.  Groups provided verbal feedback as groups at the end of the session in addition all students were given a blank sheet of paper to provide free writing feedback about the session.  Data were collated and analysed using a thematic approach to data.

Results:  Two thirds of the year group attended the session (n=50/75). Students reported that: 1) the session was valuable and useful 2) the format was enjoyable 3) they felt more aware of feedback as a result of the session 4) they felt empowered and listened to. Most provided specific, useful and constructive feedback, with suggestions for improvement. Some of the students suggested similar training for staff as they felt it would enhance their experience.

Conclusions:  The staff- student developed workshop was perceived as an enjoyable, useful and constructive event which enhanced their understanding of feedback. Students demonstrated understanding and the ability to provide useful and constructive feedback following the workshop. This study indicates that sessions developed jointly by staff and students can be constructive for learning about feedback. It also suggests that students feel their experiences may be enhanced when jointly developed feedback workshops are delivered to both staff and students.
Poster Presentation       Theme: Curriculum No 10

Poster Title: Bioethics As An Experience Of Curriculum Innovation

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Introduction: The Faculty of Dentistry of the University of Chile, the country’s oldest institution dedicated to the formation of dental surgeons, implemented in 2014 a competency-based curriculum, to respond to the country’s demands. This included a critical approach, geared towards a greater integration between the basic, preclinical and clinical training cycles and includes a paradigm shift from the old teaching and learning process. The new design was structured through the formation of Student Work Units (SWU), with an interdisciplinary approach, from basic clinical training, which demanded to reflect upon new teaching methodologies and evaluation strategies.

Objectives: 1) To identify whether the incorporation of bioethics in this new curriculum reflects the institutional social responsibility and society’s needs in the training of new professionals. 2) To identify the methodologies that have been used to promote ethical reflection, emphasizing the holistic view of the patient. 3) To identify strategies to resolve conflicts arising from the interaction of values and mechanisms to handle them.

Materials and Methods: This process implies a review of the Work Units considering the bioethics components integrated to the Dentistry curriculum 2014- 2015. Bioethics issues related to current social problems are identified and arranged in ethical discussions associated with activities to address them.

Results: A list of key concepts used in Bioethics was elaborated, incorporated in 70% of the SWU, 50 overall, through various methodologies, emphasizing group work, discussion and argumentation, in order to educate deliberation. This process was developed with other disciplines to allow training dentists to work with an interdisciplinary group of professionals in the resolution of cases.

Conclusions: Bioethics education is assumed as a constant responsibility of the academic community. Proper education is aimed at teaching and learning to think, for individuals to make free and responsible decisions in dilemma situations, according to the cultural context and differences of a plural society.
Title: A Survey of Undergraduate Teaching of Occlusion in the UK/Ireland

Author: Leung, A.

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Aim: This study investigated the teaching of occlusion in undergraduate dental schools in the United Kingdom (UK) and Ireland in relation to the syllabus, overall curriculum, methods of teaching and assessment.

Materials and Methods: A mixed qualitative/quantitative anonymised postal questionnaire was sent to the Head of Restorative Dentistry in each of the 17 undergraduate dental schools in the UK/Ireland inviting a response. The questionnaire enquired about i) teaching methods, ii) learning outcomes, iii) assessment methods, and iv) resources available, in the teaching of occlusion at the respective schools.

Results: 82.5% (14/17) of schools responded. 71.4% (10/14) of them taught occlusion as an integrated restorative discipline whereas 28.6% (4/14) treated it as a standalone discipline. 92.9% (13/14) utilised i) lectures, ii) tutorials, iii) laboratory, and iv) chairside/patient contacts to teach occlusion, whereas 7.1% (1/14) used lectures alone. There was a significant difference in the total available teaching time, varying from 5 to 180 hours (mean= 41.7 hours) with one school indicating that “there is never enough time for this”. 14.3% (2/14) of schools claimed not to assess students’ competency in this area; with qualitative data revealing comments such as, “it is a dark art” and “some teachers are afraid of this subject”.

Conclusions: There are great variations in the teaching of occlusion in undergraduate dental schools in UK/Ireland. Whilst schools devote different priorities, philosophies, time and resources to this important discipline, it could result in major variations in standards, competencies and learning outcomes achieved when undergraduate dental students graduate. The lack of assessment in two schools is concerning. The teaching of occlusion should be an integral part of undergraduate dentistry requiring a more satisfactory and standardised approach. To achieve this, a co-operative consensus in the integrated teaching and assessing of occlusion should be developed and agreed upon for all undergraduate dental students in UK/Ireland and beyond.
Poster Presentation

Theme: Curriculum No 12

Poster Title: Teaching Hematology To Dentists

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Aim: The purpose of this communication is to show our experience in teaching an undergraduate elective course, relatively new, called “Analytical Tests in Dentistry”.

This is a three-credit course, with 30 h of classroom activities, 20h of mentored work and 25h of autonomous work. The face to face activities consist of theoretical topics taught by various professionals and practices of interpretation of everyday blood analysis in clinical cases.

The dentist usually is formed to request complementary imaging diagnostic tests (Rx, CBCT, TC, NMR), but not to request hematologic tests (blood counts, coagulation tests, biochemical specific tests: Fe, vit B12,folic acid, blood glucose test, etc...) to confirm clinical diagnosis.

Materials and Methods: Students answered a questionnaire at the end of the course, which consisted of 3 sections: a) motivation, b) appropriateness and acceptance of the learning method; (c) professionalism.

The data were registered in a Microsoft Excel programme and processed with the descriptive statistics package SAS.

Results: After 3 years of teaching the course to students in 3rd and 4th year of Dentistry, it has been a growing interest by doubling the number of students enrolled last year.

We also analyze the results of the surveys of students: 90% chose the course because it could be interesting; 64% attended to all the lectures; the 90% claimed that practices had brought experience in clinical diagnosis; 77% would recommend the course because it was interesting; 48% recognized that their knowledge improved in 41-60%; 54% considered that this course would help them much in professional practice.

Conclusions: We believe in the necessity of knowledge by students of Dentistry of hematological tests. The growing interest on the course corroborates such need.
**Title:** Assessment of clinical practice in E.U. dental schools

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**Aim:** Determine if the current clinical practice training on patients is harmonised in the E.U. and corresponds to the objectives of the “Profile and competences of the graduating European Dentist” proposed in Helsinki, at the ADEE meeting in 2009.

**Materials and Methods:** An online questionnaire was translated into 7 languages (English, French, German, Italian, Portuguese, Romanian, Spanish) and sent to E.U. students via the European Dental Students Association, with the LimeSurvey platform.

23,372 final year students and 2015 graduates were targeted. The survey included 53 questions regarding the environment surrounding clinical practice (material, training, evaluation) as well as the frequency of 34 selected dental procedures for which students “must be competent” or have “knowledge of”, as defined by Cowpe et al. in 2009.

A total of 964 students participated in the questionnaire. Results were weighted according to the ratio of each member country’s annual graduates in the E.U.(Confidence level= 95% Confidence interval = +/-4%)

**Results:** 10 out of 34 procedures were performed more than 10 times for more than half of the students. 25 procedures were performed less than 5 times for a third of the student. Finally, 10% of dental students stated that they did not perform any clinical practice on patients.

66% declared either “Yes, absolutely” or “Mostly Yes” when asked if a sufficient pool of patients was available to perform the required procedures. 57.2% declared having a “very satisfactory” or “satisfactory” quantity of materials and tools.

**Conclusions:** The clinical training in E.U. dental schools does not appear to be harmonised. Further adaptations implementing competences in E.U. curriculums may be required to reach optimal undergraduate clinical training.
A Curriculum Mapping Model As A Diagnostic Tool To Improve Learning And Teaching

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Aim: To develop a curriculum mapping model and scrutinise its results to serve as a diagnostic tool in a teaching and learning quality assurance process at the University of the Andes Dental School.

Materials and Methods: A curriculum mapping model (CMM) template was developed to display key elements of the curriculum to provide a detailed vision of the current programme and guide the necessary changes. These included: ECTS distribution, Learning Outcomes’ domain, Teaching Methodology, and Assessment framework within Miller’s pyramid. Subsequently and following a descriptive quantitative analysis, all 70 undergraduate 2015 coursebooks of the BDS programme, were scrutinised following the CMM’s template.

Results: The complete transcription of the syllabus highlighted several key features of the curriculum. 28.2% of ECTS corresponded to Theory, 22.7% to Clinical work, 25.1% to Self-study, and 6.5% to Assessment. All 70 coursebooks comprised 1003 Learning Outcomes within 6 domains; 42.4% Clinical, 25.9% Basic Science, 17.4% Professionalism, 6.9% UAndes Identity, 4.1% Management and Leadership, and 3.3% Communication. There were 2008 teaching and learning sessions of which 59.6% were teacher-centred and 40.4% student-centred.

The map also showed the programme was overloaded with 935 formative and summative assessment sessions ranging from a simple quiz to Oral and OSCE Finals. Assessment demand was highest in Year-3 (216), followed by Year-2 (212) and Year-1 (202), whereas Year-6 (outreach clinical practice) had the lowest (15). Assessment methods within the four levels of Miller’s pyramid showed a high 61.5% at the “Knows” level, 5.6% at “Knows How”, 8.2% at “Shows How”, and 21.1% at the top “Does”.

Conclusions: In the knowledge age, curriculum mapping turns to be a mandatory tool to monitor the programme and a rationale for innovation. As in the present case, the CMM is driving our quality assurance in the process of implementing the Biggs’ Constructive Alignment model in order to improve our learning and teaching.
Poster Presentation

Theme: Curriculum No 15

Poster Title: Evaluation of curriculum of Oral and Maxillofacial Radiology through Correlation analysis between dental students' achievements of courses and OSCE scores

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Aim: This study aims to evaluate the effectiveness of dental school curriculum on Oral and Maxillofacial Radiology through correlation analysis between dental students' achievements of the courses and OSCEs' scores.

Materials and Methods: The correlation analysis (Pearson's r) were performed among the scores of 73 fourth-year students of KyungHee UNIV Dental School in 2014 on their three theory courses and 3rd and 4th year clinical clerkships and OSCEs on Oral and Maxillofacial Radiology.

Results: Three theory courses were related each other (1st & 2nd course: r=0.488, 2nd & 3rd: r=0.599, 3rd & 1st: 0.553). They all were statistically significant (p-value < 0.01). The scores of 3rd and 4th grade clinical clerkship were correlated (r=0.391, p-value < 0.05). The 3rd and 4th grade OSCEs' scores were related (r=0.356, p-value < 0.01). The scores of the two OSCEs were related with 2nd and 3rd courses (OSCE1 & 2nd course: r=0.271, p-value < 0.05. OSCE 1 & 3rd course: r=0.405, p-value<0.01. OSCE2 & 2nd course: r=0.266, p-value<0.05. OSCE2 & 3rd course: r=0.410, p-value<0.01). However, there were not related between two clinical clerkship and two OSCEs.

Conclusions: In this study, OSCE as a summative assessment was not related with the preceeding course such as clerkships. OSCE is an important tool of summative assessment for students' clinical achievement especially on graduation. To be effective curriculum needs to make students achieve cumulative learning objectives through a few chained courses, particularly clinical skills by clerkships.
Title: How much science is a future clinician expected to know?

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Aim: The purpose of this study is to explore how much foundational science knowledge a dentist needs to know as a future member of a healthcare team. Current studies indicate that the basic science retention with health professionals is negatively accelerated (logarithmic) upon graduation, or when it is no longer meaningful. Other research posits that most healthcare professions do not use evidence-based practice to educate students in interdisciplinary and interprofessional settings. While it is important to recognize that healthcare professionals are not scientists and that their training should be different, there is a question of how much foundational knowledge is necessary in order to be an effective, and contributing member of the health care team. Definition of this subject is imperative so as to foster accurate curriculum and competency design. An initial review of the literature indicates few studies have been conducted to determine how much science education is needed to be an effective practitioner (from any of the professional backgrounds), and how the varied backgrounds will collaborate with one another on a healthcare team. Understanding this base is timely given the pending changes to national dental examinations in the United States, and how those changes will impact curriculum.

Materials and Methods: A comprehensive review of the literature will be conducted to ascertain what science foundations are paramount for dental and healthcare professions. These findings will be countered against current educational and licensure expectations, and accreditation standards, to create a reasonable depiction of what scientific knowledge is for a trained healthcare team.

Results: Results are pending the current investigation.

Conclusions: These preliminary results will aim to help develop dental and interprofessional curricula, and better integrate clinical training with biomedical, behavioral, and research efforts.
Title: Political Pedagogical Analysis of a Brazilian Undergraduate Dental School Curriculum

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Aim: This theory-reflective study aims to analyze the Dentistry Course Curriculum at Federal University of Santa Catarina (UFSC), Brazil.

Materials and Methods: UFSC was chosen by its current moment of intense debates for Dentistry Curriculum reform. Data was collect at Institutional Websites, including main educational documents as Dental Curriculum and Political Pedagogical Project. The analysis aimed to identify main aspects of dental education in the Institution, structure, major areas and study workload. Data and reflections are presented in order to compare curriculum and Project profile.

Results: The Political Pedagogical Project is a technical document, guiding UFSC dental education, by a health-promoter contemporary approach, focused at local reality, Primary Health Care and Generalist Dentistry. Brazilian Public Health System principles (universality, equity, integrality) orientates an interdisciplinary, cross-disciplinary and multi-professional philosophy, for a multidimensional contextualized dentistry. According to National Curriculum Guidelines (2002), dentists must be able to health care, decision-making, communication, leadership, management and continuing education processes. Education must integrate Community and Health Services, with ethics, morals, science, philosophy and research. Permanent education must improve knowledge in social-oriented pedagogical processes, promoting challenges, reflections, autonomy and self-assessment. Curriculum presents a 5-years, 66 mandatory disciplines course, with: Biological and Health Sciences (27,27%), Human and Social Sciences (9,09%), Dental Sciences (43,94%), Internship (13,64%) and Monograph (6,06%). There’s a 5076 class-hours workload (average: 76,91 hours), mainly at 3rd and 4th years (1242 and 1062 hours). Workload focus on Dental Sciences (45,74%), Biological and Health Sciences (23,76%) and Internship (20,92%), with small time for Human and Social Sciences (07,45%).

Conclusions: Even with an integrated education propose for generalist, humanistic, critic and reflective practices, in all health care levels, there's a workload focus on Dental Sciences, with few spaces for other abilities and knowledges development. It recommends new approaches, with accurate scientific education and practices required by contemporary dentistry, community necessities and National Curriculum.
Poster Presentation       Theme: Curriculum No 18

Title: Special Care Dentistry: inclusion within dental school curricula evidenced by reports of ADEE Dental School visitations.

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Aims: The aim of the study was to assess if Special Care Dentistry (SCD) was included within undergraduate dental curricula within and outside of Europe, based on reports from school visitations carried out by the Association of Dental Education Europe (ADEE) between 1998-2015 as part of DentEd project (ADEE, 2003). An additional aim was to explore if the undergraduate curriculum in Special Care Dentistry published by the International Association of Disability and Oral Health in 2012, had begun to be embedded into the curriculum.

Methods: Dental School visitations published on the ADEE website (www.ADEE.org) were reviewed to assess if SCD was taught within undergraduate curricula. Published reports were reviewed to identify when and where SCD was taught in the curriculum, either as a part or whole module, or if it was mentioned in other courses. Teaching within Paediatric, Human Diseases including Oral Surgery and Oral Medicine, Geriatric and Community Dentistry were explored in depth, as well as courses teaching intravenous sedation and general anaesthesia. All reports were searched using the terms ‘special’, ‘medically’, ‘compromised’, ‘sedation’, ‘anaesth’ and ‘community’. Information was collated on an Excel spreadsheet and 20 reports were independently assessed by two reviewers to ensure accuracy of data collection.

Results: 59 Dental Schools took part in ADEE visitations:

- Leader School Visits 2014 (1)
- ADEE School Visits 2004-2015 (14)
- DentEdEvolves School Visits 2000-2001 (15)

Only 5 schools had a specific module for SCD, and although one school used the title of Special Care, SCD was not included within the module content. Analysis was challenging at times with inadequate information/detail provided in relation to care of adults with disabilities. Details were often determined from visitors’ comments and suggestions. There was limited inclusion of SCD within existing curricula and Special Needs dentistry was more often included in Integrated Dental Care. There was limited mention in other undergraduate courses on management of ‘care of special needs patients’, although some inclusion was evident within Geriatric Dentistry, Human Diseases, Integrated Patient Care and Periodontology. A defined teaching lead was identified in 12 schools, with community based dentistry mentioned in only 11 schools. SCD was specifically assessed in the summative UG exams in 7 of 59 schools.

Conclusion: To date, there has been no significant inclusion of SCD within Dental School curricula, post 2012. Curriculum review is essential for educational development and is a key driver for change, although implementation of such change can take considerable time and resource. Embedding SCD learning outcomes in UG curricula (iADH, 2012) to facilitate convergence and harmonisation between schools (ADEE, 2003) could improve oral health outcomes for people with disabilities. There is need for ‘constructive change’ through advocacy for inclusion of SCD within UG curricula.

References:

Poster Presentation

Poster Title: Introduction of conscious sedation techniques in dental education

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Aim: The aim of this study was initially to evaluate the current level of knowledge of conscious sedation techniques in several levels of dentist, and to evaluate the introduction of these competencies on the dental degree curriculum and postgraduate programs at Universidad Internacional de Cataluña.

Materials and Methods: We performed a literature review with following keywords: conscious sedation (CS), nitrous oxide & dental teaching indexed in the Web of Science and published in the journal of dental education.

Questionnaires regarding knowledge in CS were performed among Dental degree teachers and students.

Then an educational program was designed for teachers in order to give them the competency for teaching CS in undergraduate & postgraduate levels.

After implementing this knowledge in both levels a new survey was given to teachers and students, in order to review and improve the teaching process of CS.

Results: Our results show that the level of knowledge was low in all groups at the beginning in teachers, undergraduate & postgraduate students.

After implementation of these competencies in the dental curriculum of oral & maxillofacial Medicine, and seminars in the postgraduate programs the level of knowledge grew considerably.

Conclusions: There was not enough education dedicated to this subject in our dental curriculum. After the introduction in undergraduate and postgraduate programs the competencies on this topic have been achieved.
Title: Oral cancer, do we care?

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Aim: Most oral cancers are detected at advanced stages. This late diagnosis has a major impact on prognosis with a 5-year survival of only 50% for oral cancer.

Usually patients with oral cancer are first seen by primary health care professionals, including dentist.

Can our profession help detect oral cancers at the earliest stage?

We started to address this question within the context of our health center using two different approaches. On one hand, a pilot study was designed to evaluate the screening ability of sixth year dental students and compare their findings with a specialist's evaluation. On the other hand, we register lesions detected during routine care in our health center by their systematic profiling to determine their frequency.

Materials and Methods: Patients over 45 years, smokers and/or drinkers were independently examined by a sixth year dental student and by a specialist. A questionnaire evaluated the type and location of the lesion. A comparison between students’ and specialist’s evaluation was made.

Students were encouraged to declare lesions detected during their routine care. A form describing lesion was filled by a specialist.

Results: Results indicate that dental students seem aware on oral lesions despite a lack of accuracy in their diagnosis.

However, the registration of lesions detected during routine care remains low, despite the presence of a high-risk population, suggesting presence of a screening problem.

Conclusions: Both approaches present bias and the preliminary data obtained here need improvements. For example, the pre-selected population and the fact that students knew they participated in a study rendered them more attentive during the examination. Moreover, during their routine care student may have detected lesions without reporting it. In conclusion our study suggests that there is a need to reinforce the undergraduate dental student training and education in prevention and early detection of oral lesions.
Poster Presentation       Theme: Curriculum 21

Poster Title: A Comparative Analysis of Undergraduate Oral Surgery Teaching at the University of Birmingham and the University of Hong Kong

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Aim:
1. To investigate and contrast the Oral Surgery (OS) teaching of both institutions
2. To learn with, from and about each other to improve OS teaching for tomorrow’s dentists

Materials and Methods: Direct assessments of the teaching programs took place at the OS departments of both institutions. The teaching programs were compared, following analysis, recommendations to improve OS teaching in both institutions were made.

Results: OS teaching at UoB is a hybrid of conventional lecturing and student-led enquiry based learning. At HKU, teaching follows the Faculty of Dentistry’s emphasis of problem-based learning with follow up lectures and journal-based learning.

Undergraduates at UoB have 45 clinical sessions throughout their course compared to 38 at HKU. Students are required to have completed 30 extractions, assisted with 5 surgical procedures and perform 1 surgical extraction. HKU students do not have a quota requirement but average 15 extractions, 7 surgical assists and 7 surgical extractions of lower third molars before graduation.

Both cohorts are exposed to a variety of clinical teaching relating to oral surgery, including IV sedation, general anaesthesia and oral and maxillofacial surgery.

Conclusions: Specialist hospital referral for complex extraction case is available on the UK’s National Health Service (NHS) for general dental practitioners (GDPs). HKU teaching which is more focussed on surgical extractions enables GDPs to manage more complex extraction cases.

Teaching is tailored to the needs of each country’s demands of a newly qualified dentist, which is reflected in this comparative analysis.

Incorporating features of each other’s teaching would undoubtedly improve OS teaching for tomorrow’s dentists.
Poster Presentation

Poster Title: Inventory of dental students' needs regarding oral health literacy concept

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5 Dental Materials, University of Medicine and Pharmacy "Carol Davila"

Objectives: This study aims to evaluate the knowledge of dental students regarding oral health literacy concept and their needs to improve dental education in this regard.

Material and method: They collected data on oral health literacy (OHL) knowledge among 6th year dental students from “Carol Davila” U.M.P. Bucharest, Romania. In order to be involved in a research project focused on OHL assessment among adolescents in various communities and adults in dental offices within Oral Health and Community Dentistry Department, dental students attended a lecture on this subject and a practical course about OHL level's evaluation tools. The study was approved by the Ethical Committee of the University.

Results: Before lessons, 210 dental students (mean age 24.3±1.82; 64.8% females) have answered to an anonymous questionnaire and we found out a medium level of knowledge regarding the definition of the concept (33.7% give the right answer) and about the OHL role in: communication with patients (57.5%), health promotion (25.8%), oral diseases prevention (37.3%) and adherence to dental treatment (12.4%). After attending the course and the practical training, most of students recognized the factors affected by oral health literacy skills: dental health knowledge of the individuals/patients (89.9%), health behavior (78.9%) and doctor-patient communication (98.2%).

Conclusions: Dental students, as future health providers need dental education throughout curricula regarding oral health literacy, an important aspect associated with inequalities in health status and getting communication skills for a patient-centered dental care, according with individual’s oral health literacy abilities. This work was supported by “Carol Davila"University of Medicine and Pharmacy, a project number 33898/11.11.2014.
Poster Presentations: Evaluation
Poster Presentation

Title: Evaluation of the impact of early clinical exposure on the learning experiences of undergraduate students at a dental school in the united kingdom

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Affiliations:
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Aim: To evaluate the impact of clinical exposure in the first year on the learning experiences of the students.

Materials and Methods: This is a mixed methods study. Ethical approval for this study was granted by the institutional research ethics committee. Purposive sampling was used to recruit participants representing a range of stakeholder groups in undergraduate dental education including dental students, dental academics, clinical supervisors and dental nurses. Qualitative methods using semi-structured interviews and focus groups were used to explore the perceptions and experiences of stakeholders regarding early clinical exposure in dental education in order to gain a deeper understanding of the strengths and weaknesses of the clinical training model at Peninsula. All interviews and focus groups were recorded using a digital audio device and transcribed verbatim. The data was analysed thematically using NVivo 10 (QSR International Pty Ltd, Doncaster, Vic., Australia). This was followed-up by administration of a questionnaire using a series of open and closed ended questions. The questionnaire data was analysed using SPSS 22 (IBM Corp. Released 2013. IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp).

Results: Participants viewed clinical experience of students in Year 1 as an excellent training model and shared positive perceptions regarding the clinical environment. Exposure to patients at an early stage provides an appropriate context to the didactic teaching and enhances the students’ motivation for learning. Early clinical exposure also allows adequate time for the students to consolidate their skills in operative dentistry, communication, professionalism. The participants also highlighted the challenges of early clinical exposure and provided recommendations to improve the clinical training model further.

Conclusions: Early clinical exposure offers multiple benefits to enhance the learning experiences of undergraduate students. Other dental schools across Europe and further afield may also wish to consider this approach.
**Poster Presentation**

**Theme:** Evaluation No 2

**Poster Title:** Educating Dental Students to Reduce Clinical Waste Costs

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**Aim:** The UK NHS has a zero wastage policy considering environmental/economic factors. Departmental costs for dental instruments and materials is significant.

The aims of the study were to identify items that are wasted due to mistaken identity/non-use/poor handling/choice error and then educate students on reducing the wastage costs.

**Materials and Methods:** After institutional approval a 13 item questionnaire was circulated to all students during clinical sessions. Students were asked to complete how many instruments and materials were collected and at the end how many were not used with explanation. All answers were confidential and voluntary.

**Results:** Data was collected during a sequential four-week period. 95 dental procedures were collected, of which 39 procedures incurred wastage (41%). The cost of wastage across the four dental student teams working in the hospital were estimated to amount to over £1700 a month and annually over £20,000. An email was sent out to implement the following changes to reduce wastage:

1. More precise zoning for materials was created with education on clean and dirty zones. Unused and uncontaminated items could then be returned to dispatch.
2. An area at dispatch was created for un-used items to be placed, such as un-used burs and composite capsules etc.
3. Students were informed of the cost of items at dispatch.
4. Visual reminders were placed in each clinical bay to reduce wastage with indicative costs.

After a period of 8 weeks during which the above changes were implemented a second data collection was done for four consecutive weeks. During the second period only 6% of clinical procedures incurred wastage compared to the original 41%.

**Conclusions:** When students are educated on clinical wastage significant cost savings can be made. However, due to memory attrition repeated periods of monitoring and re-education are recommended to achieve sustained cost reductions.
Poster Title: First-round accreditation of dental education in Korea

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Aim: Accreditation is essential for a reasonable assurance that students should graduate with competencies required for practice. The Korean Institute of Dental Education and Evaluation (KIDEE) established in 2007 and accomplished the first-round accreditation on the every dental school in 2012. The dental accreditation system introduced to encourage self-assessment and the process of continuous quality improvement in educational programs.

Materials and Methods: The accreditation standards set by KIDEE include 5 areas (standards 1-5) and 20 categories. Across the categories, there are 55 specific basic standards to meet. Area 1 for the accreditation standards is to ensure institutional effectiveness. Area 2 is about the educational program. It is comprised of Objectives of the educational program; Curriculum design & management; Basic science program; Clinical program; Humanities & social science program and lastly institutional support for clinical education. Area 3 is about support services for students. The 4th area is about Educational Faculty & Staff. The final area for the accreditation standards is facilities and resources requirements.

Results: Up to 85.3% of standards were satisfied and all 11 dental schools were accredited. Though none of the institutions evaluated fell into the ‘Deficiency’ category, 14.7% received a recommendation for improvement. Certain areas of accreditation standards, such as facilities (92%), and the administration/finances (91%) were satisfied relatively better than others such as students (88.2%) and curriculum (78.1%) areas.

Conclusions: KIDEE had accomplished the first-round accreditation and the every dental school was accredited. The information obtained from survey of first-round accreditation has improved the quality of accreditation process, and KIDEE now executes second round accreditation procedure. Accreditation of educational programs is a component of self-regulation of the profession of dentistry also. By accreditation process we can fulfill the obligation of public trust and accountability in several ways.
Poster Presentation

**Poster Title:** Extraction of the Wrong Tooth: Experiences and Lessons Learned

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**Aim:** ‘Wrong Site Surgery’ tops the list of patient safety ‘Never Events’. The latter are described as ‘unacceptable and eminently preventable’. Such incidents have far-reaching implications for patients and clinicians. In dentistry, wrong tooth extraction is the main type of ‘Wrong Site Surgery’. The frequency of and reasons for such cases, is unclear. The aim was to assess how often dentists in Wales extract the wrong tooth and under what circumstances and to identify preventative and educational measures.

**Materials and Methods:** Dentists registered with the Wales Deanery, UK (n=1053) were invited to complete an anonymous, online survey. This comprised closed questions on the frequency and reporting behaviours of wrong tooth extractions and open-spaces for respondents to explain the circumstances behind the error and the lessons subsequently learned. Information on systems to minimise risk of wrong tooth extraction was requested.

**Results:** 380 surveys were completed. 46% had been qualified for more than twenty years. Forty-eight (13%) reported experience of extracting the wrong tooth, nine of those more than once. In both instances, the error related typically to permanent teeth (86% (n=36) and 89% (n=8) respectively). 49% reported the error to external individuals/organisations. Miscommunication with other professionals, time pressures, inexperience, diagnostic or extraction difficulties and simple mistakes were reported as reasons for the error. Respondents found the event “a distressing experience” and a life-time memory resulting in double/treble checking of notes and verification with patients and other staff before and during the procedure. Pre-extraction checklists were more commonly used in hospitals.

**Conclusions:** A minority of respondents reported incidents of ‘Wrong Site’ extractions but as well as being a patient safety concern, for many clinicians, it remained a distressing memory. Consideration should be given to educational supervision, practice environments and workload and cross-professional communication.
**Title:** Knowledge, Attitudes, and Behavior regarding an Evidence-based approach to Dentistry: a survey among fourth-year Universitat Internacional de Catalunya (Spain) dental students

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**Aim:** The purpose of this study was to evaluate the level of understanding, perceptions and skills related to the Evidence-based approach and practices among Universitat Internacional de Catalunya dental students completing their fourth year.

**Materials and Methods:** a survey was conducted among 96 4th-year dental students using the Knowledge, Attitudes, Access, and Confidence Evaluation (KACE) questionnaire, a validated instrument specifically designed to assess these outcomes within a dentistry setting. Data were gathered during regular class time and later analysed by means of percentages and means of standard deviation.

**Results:** The preliminary results showed that a slight group of the students reported 50% knowledge in Evidence-Based practices.

**Conclusions:** The findings of this survey suggest that students need more training in some aspects of EBP research. Further analysis of these results will be useful to education leaders involved in the development of future dentistry program curricula and policy.
Poster Presentation

Theme: Evaluation No 6

Oral Title: Qualitative Data Analysis Following a Part-time Master’s Programme

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Aim: This study assesses participants’ perceptions of their learning experience following a flexible five year part-time master’s programme in Restorative Dental Practice (RDP), designed for GDPs. Mixed qualitative/quantitative data were collected throughout the programme. The enriched mixed data were analysed, triangulated and reported in order to enhance the validity of the findings.

Materials and Methods: Teaching occurred in peer groups each with eight participants. Qualitative data were collected in the form of: (i) questionnaires (comments following quantitative questions), (ii) focus group discussions, (iii) semi-structured interviews and (iv) field notes. Paper based questionnaires were used throughout this study; focus group discussions were held during year one; personal interviews were held at the end of the programme and field notes were collected throughout the research.

Qualitative data were recorded, transcribed, organised and analysed by the researcher. The analysis was undertaken using a thematic approach, with some narrative components where appropriate.

Results: 144 GDPs commenced the programme in 2010 and 2011 (72 in each cohort). 25 (17%) successfully completed the master’s programme. 20 personal interviews were conducted at the conclusion of the RDP programme. The main themes that evolved during analysis included: confidence, learning experience, motivation, and the impact of the programme on clinical practice. There was a strong direct link between the GDPs’ levels of perceived confidence and the learning experience. GDPs reported a significant positive impact on their clinical practice e.g. treatment planning and choice of materials.

Conclusions: Qualitative data analysis proved to be a suitable way for assessing GDPs’ perceptions before, during and after this part time master’s programme. The perceptions of GDPs in this study centred on the gradual increase in their confidence and self-efficacy, which was closely linked to the learning experience. The impact of increased confidence on their clinical practice was fundamental to the changes they made and the degree of patient satisfaction.
**Poster Presentation**  
**Theme: Evaluation No 7**

**Poster Title:** Perceived levels and sources of stress among dental students following a shortened graduate entry dental course.

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**Aim:** Aberdeen dental school admits graduates for a 4 year shortened course of Dentistry. A stress survey was conducted to determine the perceived levels of stress and to identify the potential sources of stress among dental students within a dental school environment.

**Materials and Methods:** 69 dental students participated in a cross-sectional, questionnaire based survey conducted in Aberdeen Dental School during Spring Semester 2016 (response rate=86.3%). Stress levels and sources of stress were measured using Perceived Stress Scale (PSS-10) and Dental Environment Stress respectively. Independent sample t-tests and one way ANOVA were used for data analysis. All statistical analyses were conducted using SPSS.

**Results:** Participants’ mean age was 26.1 years (22-45), 68% were females and 32% were males. The mean PSS score was 18.7 (6.9). There were no statistically significant differences by year of study and gender in the perceived stress levels and sources of stress. DES sub scales revealed no statistically significant differences between years of study, except year 3 (12.3±5.6, p = 0.042) had significantly greater levels of stress compared to year 2 (8 ± 1) in areas related to faculty and administration. In DES items highest stress ratings were received for examinations and grades (47.8%), fear of failing course or year (39.1%) and completing graduation requirements (29%). Ranking of the mean stress score of the DES sub scales indicated that self-efficacy beliefs (14.9) was the category students perceived as the most stressful, followed by faculty and administration (10.1) and personal problems (9.0).

**Conclusions:** Levels of perceived stress were high in this sample of dental students. The most common sources of stress were related to students’ self-efficacy beliefs such as fear of failing course or year. Possible stress management strategies focusing on the observed sources of stress should be implemented to help students cope with the stress.
**Poster Presentation**

**Theme: Evaluation No 8**

**Poster Title:** I want a secure job, work with people and I like working with my hands

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**Aim:** Dental students’ study motives have previously been explored (Scarbecz & Ross 2002, Vigild & Schwarz 2001). Motives behind students’ disciplinary choice influence their interest in studies and study progress. In Finland, dental students have to pass a demanding entrance examination. Those accepted are persistent and highly motivated students. This study aims at examining the first-year dental students’ self-reported study motives at the University of Helsinki.

**Materials and Methods:** In 2011 the 1st year dental students (51) were asked to fill in a web-based questionnaire in which they were asked to describe in their own words their study motives. 46 students answered and 37 gave their informed consent. 68% of participants were women and 32% male. Their age ranged from 20 to 39 years. The data were analysed using qualitative content analysis by two independent coders. Similar questionnaire will be sent to the same students in 2016 to study the persistence of their study motives.

**Results:** Dental students referred most often to a practical motive of heading for a good and secure profession (73%). Students also described the motives of working with hands (24%), wish to change a profession (22%) and working with people (22%). Most students expressed more than one motive. The number of motives ranged from one to four.

**Conclusions:** The 1st year students’ motives for disciplinary choice indicated their ideas of the content of the studies and their future work-life orientation. The motives reported here are all relevant and well-aligned with the desired learning outcomes of the curriculum and previous studies on study motives. Students’ interest in practice of dental profession, manual dexterity and working with people should be cherished throughout the study years to support study motivation.
**Title:** Using art and free text to understand the emotion of treating first patients

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**Aim:** The purpose of the study was to explore the thoughts and feelings of dental undergraduates as they transition from a skills laboratory to a clinical setting to treat their first patients.

**Materials and Methods:** 82 dental undergraduates in their second year of study who had recently completed a skills laboratory course in basic periodontology and operative dentistry were invited to participate. Data were gathered using two methods. Firstly, students were provided with a blank A5 sheet of paper and asked to draw a sketch that expressed their feelings about treating members of the public for the first time. Secondly, they were given a single Post-it note and asked to record their biggest fear and what staff could do to help. All submissions were anonymous. Both art and text were arranged into common themes.

**Results:** A selection of the artwork will be displayed as part of the poster. Major emergent themes were anxiety, uncertainty, embarrassment and excitement.

Major emergent themes from the Post-it notes were communication skills, clinical skills, local anaesthesia, patient comfort, and patient expectations. A selection of text from the post-it notes will be included as pull out quotes.

It is acknowledged that the transition from a skills laboratory to a clinical environment is particularly challenging for students (and staff). Data from this study provides an extra insight in our understanding of this complex area.

**Conclusions:** The use of art and short extracts of free text proved to be a powerful tool to record the emotion associated with initial patient contact and treatment. While there were no preconceptions, some results were surprising and will better inform clinicians, nursing and reception staff. This will improve support offered to students and could form a basis for future research.
Poster Presentation

Theme: Evaluation No 10

Poster Title: The student of feedback for the scenario based evaluation using the SBT(Smart-device Based Test)

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Background: The College of Dentistry of Yonsei University has been implementing competency evaluations targeted toward its expected-to-graduate students. Such evaluations, which take place at the clinic for dental students, are consisted of Clinical competency evaluation and scenario based evaluation for patient treatment. However, communications ability, biomedical knowledge, treatment plans for the disabled and emergency patients, and evidence based decision-making is difficult to assess. As such, Yonsei University decided to apply a novel evaluation method for which several professors of their respective fields constructed related test-items in December, 2015 and was implemented as SBT (Smart-device Based Test).

Aims: The purpose of this study was to inquire about opinions toward the SBT method. The responses of students' opinions were analyzed and investigation of the appropriate item format construction when using such devices in competency evaluations was of interest.

Materials and methods: After the assessments, students replied to a questionnaire of questions asking about the opinions of using SBT and the composition of the test items. It consisted of a total of 15 items comprised of questions asking about the convenience of the smart apparatus, the stability of the system during use, the content and font of the test items, the configuration of the monitor, test-quality, the differences between paper-tests, suggestions about the time needed, and opinions about test items. All of the 68 seniors who took the tests took the survey.

Results: 91.2% replied that the smart device menu was easy to understand. 72.1% of the students answered that it was convenient and that they were very familiar with smart devices. 86.8% responded that the construction of the problem scenarios were appropriate, and over 88% of the students replied that the font was appropriate. Satisfaction with the content of the monitor and visual materials was found to be above 66%. While satisfaction with the test administered using the smart device was 77.9%, the proportion of students who chose the paper-test method was higher at 67.6% among the two methods. Students responded that the test was difficult and that smart device based tests required more time. There were also students who replied that the sound from the computer keyboard was noisy.

Conclusions: Students showed no difficulty in handling assessments that utilized smart devices. Also, students responded that the tests were meaningful in that test-items were based on oral cavity pictures and x-rays as they allowed the students to experience authentic cases for which hands-on experience is limited. Test-items can be constructed to accommodate those that could promote deeper-thinking by enlarging the pictures presented, controlling the test allocated to problem-solving when compared to items in a paper-test counterpart. Furthermore, the responses to the descriptive problems are instantly transformed into data to allow quickly delivery to raters and the possibility of the rater providing each other feedback on the results after rating.
Aim: The implementation of a curriculum based in competencies, integrates the learning of the students as the center of the teaching-learning process. At the Faculty of Dentistry, the courses were transformed into Student Work Units (SWU), which gather teachers from basic sciences, clinical simulation and clinical training working together. The aim of this study was to evaluate this curricular innovation at different formative levels.

Materials and Methods: This study used qualitative data, obtained through a questionnaire answered by a sample of 217 students. The questions were focused in key dimensions of the implementation of this new curriculum. The questionnaire was designed including multiple choice questions and the dimensions assessed were: Teaching and Learning Methodologies (TLM), Evaluation Strategies (ES), Resources and Time Management (RTM), Self-assessment (SA). The results of the questionnaire were analyzed and presented to the teaching staff. Using this information the teaching teams implemented changes in the areas poorly evaluated, before the end of the academic year.

Results: The TLM were positively evaluated by 90% of the sample. Regarding the ES, the main issues were poor feedback and evaluation turnaround time. Concerning RTM, the hours allocated for self-learning were considered not sufficient for 70% of the SWU. The results showed that literature revision was the lowest aspect evaluated whereas activities that included participation were considered as the best learning activities. The teaching staff were informed of these results, and intermediate changes were developed to improve the aspects that were poorly evaluated. During this innovative process of curriculum development, it was possible to include internal evaluations, allowing constant monitoring and follow-up, using the student’s opinion as an applicable tool.

Conclusions: The teaching staff became aware of the results, reflected on them and created new alternatives to improve the teaching-learning process.
Poster Presentation

Oral Title: Evaluation of Flipped Class Teaching in Postgraduate Dentistry

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Aim: To explore the potential of ‘flipping’ lectures for postgraduate dental students, focusing on student approaches and perceptions. The traditional classroom lecture was replaced with a video lecture followed by a ‘flipped’ face-to-face lecture.

Materials and Methods: Part-time (PT; n=14) and full-time (FT; n=13), master’s students participated. They observed a traditional lecture delivered by video and then submitted their questions, by email, which formed the basis of a ‘flipped’ lecture. Following the lecture, students completed a questionnaire and attended focus groups.

Results: Questionnaire responses and focus group recordings were analysed. 43% (PT) and 0% (FT) thought learning with the video lecture was ‘more effective’; 43% (PT) and 39% (FT) thought it was ‘as effective’ and 14% (PT) and 62% (FT) ‘less effective’, than a traditional lecture. 50% (PT) and 77% (FT) thought learning in the flipped lecture was ‘more effective’; 43% (PT) and 23% (FT) ‘as effective’ and 7% (PT) and 0% (FT) ‘less effective’, than in the traditional lecture. Regarding the overall flipped class model, 43% (PT) and 77% (FT) learned ‘more’; 43% (PT) and 15% (FT) ‘the same’ and 14% (PT) and 8% (FT) ‘less’, than with the traditional model.

Conclusions: Overall, the student response was convincingly positive. A majority said they would like more of their teaching using the flipped model. Students did not believe the flipped model should replace the traditional lecture entirely and believed it would be better suited to some topics than others. A student-centred, interactive class approach was facilitated by the requirement to submit questions. Students generally attended the face-to-face class better prepared, having watched the video lecture and read more than usual. Teachers were able to address questions in greater depth and detail and students liked the focus on their specific concerns. This innovative approach to teaching has much merit in dental education.
Title: Dental Students’ awareness of accreditation standards and education terminologies: A Qualitative study using students’ qualitative course evaluation.

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Aim: Accreditation process not only improves school standards and outcomes, but also on its own is a teaching experience for the school faculty, administration and students. With our dental school undergoing Commission on Dental Accreditation (CODA) and National Commission for Academic Accreditation and Assessment (NCAAA) accreditation process, dental students went through a lot of experiences during this accreditation journey.

The objective of this qualitative study was to explore dental students’ awareness of accreditation standards and education terminologies using students’ qualitative feedback for undergraduate dental courses and modules.

Materials and Methods: The data used for this study were qualitative feedback for undergraduate dental courses and modules that had been conducted as part of the systematic courses evaluation process in conjugation with traditional quantitative course evaluation. A total of six classes participated in this study evaluating 12 different courses. Students in groups were asked to provide qualitative feedback for undergraduate dental courses/ modules by asking about positive things that the course should continue on, obstacles or problems faced in the course and the corresponding recommended changes to improve for next year. Themes and terminologies related to CODA and NCAAA were identified.

Results: Dental students had critically critiqued courses and modules they are taking using CODA and NCAAA standards and terminologies. Students commented about areas were Intended Learning Outcomes (ILOs) did not match course assessment, areas showing redundancy in content, suggest calibration between faculty in using certain rubrics when they noticed faculty disagreement, and suggest feedback mechanisms to enhance students’ learning for certain assessments.

Conclusions: This study demonstrated that with the dental school undergoing accreditation process, dental students’ awareness of legitimate teaching and assessment standards and proper use of education terminologies was reflected in their impressive qualitative feedback critiquing courses and modules offered for undergraduate dental students.
Poster Presentation       Theme: Evaluation No 14

Poster Title: Validation of Perceived Stress Questionnaire amongst dental students (DES)

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Aim: To Analyze the factorial structure and reliability of the Academic Stress Scale amongst dental students, University of Concepción

Materials and Methods: Quantitative non-experimental, cross-sectional study.

The initial sample was 158 students, valid sample of 156 students, of which 98 (62.82%) were female and 57 (36.54%) were men, with one omission

INSTRUMENTS: Stress Perceptions Questionnaire amongst Dental Students (Dental Environmental Stress (DES))
Maslach Burnout Inventory (MBIS)

TYPE OF ANALYSIS:
The processing of the psychometric properties of Perceived Stress Questionnaire amongst Dental Students will be based on four procedures:
1. To evaluate its construct validity, factor structure of the instrument will be analyzed by an Exploratory Factor Analysis.
2. The reliability of the factors identified in terms of their internal consistency.
3. As evidence of construct validity, convergent and discriminant capacity of the questionnaire was assessed by evaluating their relationship with two questions that make an overall measure of general and academic stress respectively.
4. Criterion validity of the scale will be analyzed, evaluating its relationship with Burnout levels amongst dental students.

Results: KMO, as Bartlett’s sphericity test support the appropriateness of factor analysis. Four factors were found: Factor I: Academic Requirements: α=0.83. Factor II: Educational Environment: α=0.79. Factor III: Difficulty of clinical work: α=0.81. Factor IV: Personal concerns: α=0.81.

Correlation factors were analyzed with two questions at the beginning of the instrument, being statistically significant correlation between all factors except personal concerns with academic stress.

In assessing evidence of validity associated with the criterion of Burnout it found that emotional exhaustion correlated directly and statistically significant with all the factors of the questionnaire, depersonalization only with personal concerns, and lack of personal accomplishment with academic demands, educational environment and difficulties of clinical work.

Conclusions: The questionnaire of perceived stress amongst dental students, DES, presents suitable psychometric properties for use in dental students.
Title: Grit as a Predictor of Academic Achievements in First Year Dental Students: One Year Follow Up Study

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Affiliations:
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Aim: To evaluate the relationship between grit, as perseverance and passion for long term goals, and academic achievements in first year dental students at the University of the Andes, Santiago, Chile.

Materials and Methods: Starting 2015 academic year, all 98 first year dental students from University of the Andes were invited to voluntarily complete the Duckworth 2009 Grit Scale. This measures grit in a scale from 1 (not at all grit) to 5 (extremely grit). Results of the scale were correlated to students’ end-of-year high stakes examination marks.

Results: A total of 73 students (75%) consented and completed the Grit Scale; 53 females, mean age of 18.8 years. Scale’s Cronbach alpha was 0.692. The mean grit score was 3.5 (ds=0.5, range=2.1 to 4.6), and there was no gender difference. Five students (5%) showed a grit score lower than two standard deviations (≤2.5) of the mean, while 6 students (8%) exhibited a grit score higher than two standard deviations of the mean (≥4.5).

Grit did not show a statistically significant correlation to the National University Admission Tests scores (F 0.922, p= 0.549). However, grit scores did show a statistically significant correlation to end-of-year examination marks (r 0.708, p<0.0001).

The mean end-of-year score of all 73 participants was 73.7% (sd=5.9). Using discrimination index the strong 27% performing students exhibited a mean end-of-year mark of 81.4 % (sd=1.9) and a mean grit score of 3.8 (sd=0.4). In contrast, the weak 27% performing students presented a mean end-of-year mark of 65.7 % (sd=2.6) and a mean grit score of 2.8 (sd=0.3). This difference was statistically significant (p<0.0001). Four students failed the course; their grit score was ≤2.9.

Conclusions: Grit scores of first year dental students could be used in the early detection of those that might be at risk of academic failure, in order to implement some support measures.
Poster Presentation       Theme: Evaluation No 16

Poster Title:  Validation of the College Environment Scale amongst Dentistry Students (CEAU-O).

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Aim:  To analyze the factorial structure and reliability of the College Environment Scale among Dentistry Students.

Materials and Methods:  Quantitative non-experimental, cross-sectional study. Initial sample 158 students, and Real students 130, 78 (60.00%) were female and 51 (39.23%) were men, with one omission.

INSTRUMENTS: Questionnaire for Educational Environment Assessment in Dentistry (CEAU-O) and Dundee Ready Educational Environment Measure (DREEM).

TYPE OF ANALYSIS:  The processing of the psychometric properties will be based on the following procedures:
1. To assess construct validity, instrument’s factor structure will be analyzed through an Exploratory Factor Analysis using the extraction method of Principal Axes Analysis, AEP.
2. Assess the relevance of the factor analysis (Kaiser-Meyer-Olkin sampling adequacy, and the Bartlett’s sphericity test).
3. Estimate the number of factors: 1) The Kaiser-Guttman criterion or latent root and 2) contrast criteria fall (Scree plot), and Horn’s Parallel Analysis.
4. Reliability of the identified factors will be assessed in terms of their Internal consistency.
5. To estimate the convergent and discriminant capacity of CEAU-O, the correlation of the identified factors with DREEM scale will be analyzed.
6. A descriptive statistical analysis.

Results:  KMO and Bartlett’s test: both supporting the adequacy of factor analysis.

Kaiser-Guttman or latent root: three factors identified. Contrast fall Criterion (Scree plot): 1 Factor. Horn’s Parallel analysis: 3 factors.
Factor I: Evaluative Process: Cronbach alpha coefficient α = 0.92. Factor II: Learning opportunities: reliability α = 0.85. Factor III: Student participation: reliability α = 0.80. The relationship between the evaluated factors was evaluated, using Pearson correlation coefficient by unilateral contrast, being direct correlations and statistically significant.

The worst evaluated factor corresponds to Learning opportunities, they evaluated as positive its participation in the teaching-learning process, results confirm with those obtained in the DREEM survey where students evaluated more negatively Teachers Perception.

Conclusions: CEAU-O, presents adequate psychometric properties for use amongst dental students.
**Poster Presentation**

**Theme: Evaluation No 17**

**Poster Title:** Evaluation of depression levels of dental students

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**Aim:** Dental students are more prone to depression due to various sources of stress. It is very important to determine the depressed individuals before more serious psychological illness happens. The aim of this study was to determine the depression levels of the students in Yeditepe University in different educational periods, and to examine the effect of demographic factors on depression.

**Materials and Methods:** All students enrolled in Yeditepe University Faculty of Dentistry in 2015-2016 educational period were included in the study. A Zung Self-Rating Depression Scale, consists of 20 items for depression level measurement was used, the validity of which was already conducted by a Turkish researcher before. The forms were filled in a lesson in the middle of the second semester of each year. Only age and gender were asked in order to protect the confidentiality, and students filled out the form voluntarily. In the scale, each item was evaluated according to the 4-point Likert-type scale; never, sometimes, often, always. According to the obtained values, the levels of depression were defined as; normal, mild depression, moderate depression, and severe depression. Pearson chi-square test was used to analyze the data.

**Results:** The response rate was 87.4%. There were 235 students, 72 (30.6%) were male and 163 (69.4%) were female, with the mean age of 21.58 ± 2.02 years. Of the participants, 30.2% were mildly, 13.2% were moderately, and 5.1% were severely depressed. The ratios of mild (32.5%) and moderate (16.6%) depression in females were higher than males; 25% and 5.6%, respectively (p<0.05). There were no statistically differences between depression levels in terms of educational period and age.

**Conclusions:** It can be concluded that 18.3% of dental students showed symptoms of moderate or severe depression. These findings suggest that a need exists for mental healthcare services for dental students.
Poster Presentation

Poster Title: Results After One-Year Implementation Of The Student Mentoring Program Of The Dentistry Faculty Of Universitat Internacional De Catalunya

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Aims: 1) to educate and train the selected voluntary group of fifth-year mentored students in terms of self- and work-management, and the interaction between students, patients and teachers.

2) to evaluate and compare the development of the skills acquirement on the selected voluntary group of fifth-year mentored students before, during and after the end of the course and between their fellow students (control group) and the third-year mentored students.

Materials and Methods: According to Thalento® CUBES Competency description (Model ES 1 0_2), a questioner of 114 questions were adapted to dental practice to evaluate the 19 previously defined skills.

10 selected students formed the voluntary group of fifth-year mentored students according to their personal, academic and motivational profile. Before the beginning of the course, they received theoretical training on the 19 competences by a professional coach, followed by individual coaching and monthly group meetings.

Throughout the academic year, those 10 students assist to the Dental Clinic as mentors for the third-year students to help them to develop and enhance the defined skills, as well as to facilitate their incorporation in their first year in the Dental Clinic.

Results: There were statistically significant differences (p<0,05) on the skills development acquirement on the selected voluntary group of fifth-year mentored students before and during the course compared to the control group. We are waiting for the final results at the end of the course.

Regarding the third-year mentored students results we observed a progress on the skills acquirement.

Conclusions: The program has allowed the selected voluntary group of fifth-year mentored students to achieve and develop the specific skills, more than the control group and the third-year mentored students.
Title: How do our students want to learn orthodontic clinical skills? Listening and responding to the student voice: an elective project.

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Aim: To investigate student perception of current teaching practice and self-reported student confidence in undertaking practical orthodontic procedures.

Background:

Engagement within Higher Education has been defined as “the process whereby institutions... make deliberate attempts to involve and empower students in the process of shaping the learning experience” (1). Dental undergraduates participate in two tutorials to practice clinical orthodontic skills during Year 3. They treat their first orthodontic patient two months later. A pilot survey of 66 fourth-year dental undergraduates found 66% of those who responded (37/56) perceived a need for more support when learning orthodontic clinical skills.

Materials and Methods: Sixty-nine third-year students were asked to complete a self-report questionnaire on two occasions:
• T1, immediately following the practical tutorials and
• T2, two months later, after treating their first orthodontic patients.
Students were asked to state their preferred method of support for learning to fit and adjust fixed orthodontic appliances. The data obtained were analysed using SPSS software (2).

Results: The response rates for T1 and T2 questionnaires for third-year students were 72.5% (N=50) and 78.3% (N=54) respectively. There was evidence of a reduction in students’ confidence-levels between T1 and T2 (p=0.043). Of those students who participated 89% (N=48) would have felt more prepared for orthodontic patients if current teaching had been supported by other means. Current timetabling of teaching was criticised with students requesting a repeat of the practical tutorial just before treating orthodontic patients. A preference was shown for e-tutorials and video demonstrations to support learning.

Conclusions: Responding to student feedback about their learning experience is important for engagement. This student-led study suggested several changes to support students during the transition from pre-clinical to clinical stages of teaching. E-tutorials and video demonstrations are currently being developed to assist with consolidating the knowledge gained during practical orthodontic tutorials.
Poster Presentation       Theme: Evaluation No 20

Poster Title: Evaluation of a Problem with the Aid of Constructive Alignment

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Aim: To evaluate a problem with the aid of constructive alignment i.e. the interrelationship between the selected problem, learning objectives, process variables and students’ achievements.

The students at the 5-year dental undergraduate programme in Malmö take care of children at course 8 for the first time. It is crucial that problems in PBL are effective in helping students to learn and understand a topic thoroughly. Seminars for the whole class are based on students’ questions formulated in the in the study groups. Summative assessment during the end of the course is based on clinical cases.

Materials and Methods: The sample consisted of one student cohort (48 students, 6 groups). The problem was presented as a text “Jens have had orthodontic appliance for half a year. He notices that his teeth have moved and that the teeth use to hurt a few days after the dentist has activated the appliance...“ The problem is planned to align to the learning objectives “student should be able to explain how the oral tissue react to orthodontic tooth movement and side effects of this tooth movement”. Hypotheses and seminar questions were written in a data platform by each study group and were analyzed. Students’ answers to examination questions were assessed using the SOLO-taxonomy. Finally, students’ self-reports on their achievement regarding the learning objective were analyzed.

Results: All groups formulated problems to “Jens” that were aligned with the actual learning objective. The hypotheses quality varied and several were not complete. Most groups formulated hypotheses with a biological and a clinical approach. The seminar questions were mainly focused on cellular events during orthodontic tooth movement. A majority of the students (95%) passed the written examination. About 90% stated that they reached the actual learning objective.

Conclusions: The principle constructive alignment worked well to evaluate the relevance and characteristics of a problem
Poster Presentation

Poster Title: Skill performance evaluation of dental students for mixing dental cements

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Aim: A skill performance criteria system was developed in Dental Materials Department, “Carol Davila” U.M.P. Bucharest, in order to improve student’s skills on preparing dental materials.

Materials and Methods: For this study, 1st year dental students were trained and evaluated on their skill performance for mixing zinc phosphate cement for a base consistency. Five criteria to be followed by students during preparation of the material were described in the form. Criteria 1: Mixing ratio according to manufacturer; Criteria 2: Progressive incorporation of the powder into the liquid; Criteria 3: Mixing on a large surface to dissipate heat; Criteria 4: Final putty-like consistency, will roll into a ball; Criteria 5: Mix is completed within specified mixing time. Each criteria was scored with 1 for satisfactory performance and 0 for unsatisfactory performance. The student self-evaluated using the designated column. After teacher’s evaluation, the skill performance was discussed based on both evaluations. Data were prepared and analyzed with the software SPSS 20.

Results: A total of 236 students were surveyed. For the 4th criteria was observed the highest number of unsatisfactory scores, both for students and teachers evaluations, 37 students (15.7%) performed unsatisfactory according to self-assessment and 45 students (19.1%) according to teacher’s evaluation. 149 students (63.1%) reached the maximum competency level according to teacher’s evaluation. For 36.9% of students with unsatisfactory performance, remediation occurred until criteria were performed satisfactory.

Conclusions: Student’s self-assessment of their dental cements preparation skills performance optimised their greater understanding on the preparation technique and properties of the material, with impact on their motivation to learn and performance outcomes.
Poster Presentation

Theme: Evaluation No 22

Poster Title: Extended extraction OSCE; what do students think?

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Aim: To determine student perceptions of difficulty, fairness and required knowledge for an extended extraction OSCE.

Materials and Methods: The extended OSCE was administered to all BDS4 students (n = 73). In Part 1 (4 minutes), students were provided with radiographs and models simulating a clinical scenario. They had to ascertain the best suited instrument to remove 6 teeth. A referral for surgery (REF MOS) was also available. In Part 2 (2 minutes), students were provided with forceps and asked to demonstrate an extraction.

A feedback questionnaire was administered to determine student perception of the OSCE. The questions included 5 point Likert type response sets for fairness and difficulty, a 10 point scale of overall difficulty and free text response options.

Results: 70 students provided feedback (96% response rate).

Part 1. 47.1% perceived it “neither difficult nor easy”, 44.3% “difficult/very difficult” compared with 8.6% “easy”. When considering fairness 80% thought it “completely fair/quite fair”, 11.4% “neither fair nor unfair” compared with 8.5% “quite unfair/completely unfair”. 90% of students “strongly agreed/agreed” the extended OSCE required a greater degree of understanding of preoperative assessment compared with simple extraction OSCEs in BDS2/3; 8.6% “neither disagreeing nor agreeing” and 1.4 % “strongly disagreeing”.

Part 2. 74.3% perceived it to be “very easy/easy”, 24.3% “neither difficult nor easy” and 1.4% “difficult”. It was perceived as “completely fair/ fair” by 92.9% with 4.3% “neither fair nor unfair”.

Overall difficulty rating (1 too easy -10 too hard) was between scores 5 (28.6%), 6(17.1%), 7 (32.9%), 8 (11.4%). Common emerging themes related to time constraints and the need for additional teaching of dental elevators.

Conclusions: Students perceived the examination to be a fair assessment of their knowledge and practical ability at their stage of the degree course extending them beyond the simple extraction examination.
Poster Presentation

**Poster Title:** Relationship between stress and Burnout with the perception of the educational environment in the clinical course of dentistry in a traditional university.

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**Aim:** To determine the relationship between academic stress and Burnout with the perception of educational environment amongst students in clinical dentistry cycle in a traditional University of Concepcion, Chile.

**Materials and Methods:** A Cross-sectional study in a sample of 158 students in fourth, fifth and sixth year, by applying four instruments that assess the academic climate perception (DREEM), the clinic educational environment (CEAU-O), academic stress (DES) and Burnout (MBI-S) amongst dental students.

**Results:** All DES factors, MBI-S “Emotional Exhaustion” and “Lack of Personal Fulfillment” Factors had an inverse and statistically significant correlation with all CEAU-O and DREEM factors. The “Depersonalization” factor inversely correlated and statistically significant only with DREEM “Academic Experience” factor.

**Conclusions:** The results shows that students who have a lower perception of the environment and educational climate, have higher scores on scales Academic Stress and Burnout, revealing the need for institutional intervention.
Title: A comparison between two student-led international dental volunteer work programmes

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Aim: Dental volunteer work programmes offer oral health education and dental treatment to populations whom for varied reasons have limited access to oral health resources. The Amchi (India) and Pamoja (Tanzania) projects are two volunteer work campaigns organized by the European Dental Students’ Association together with Manipal University (Amchi) and Muhimbili University (Pamoja). The aim of this study is to compare the two projects regarding the setting, project preparations and development.

Materials and Methods: The following criteria were selected for comparison: participants (number, country of origin, training), project planning stages, local university involvement, clinical work performed, research performed, finances, local demographics and difficulties encountered. These aforementioned factors were investigated by coordinators and participants who took part in both programs.

Results: The two projects were organized with a similar structure. The duration of the projects was two weeks and involved two different locations. The reasons for limited access to dental care in the target populations were different. The Amchi Programme was based in the Indian Himalayas. The remote location was a barrier to accessing dental care. The Pamoja Programme was held in Tanzania’s largest cities – Dar es Salaam and Morogoro. One of the barriers to accessing dental care here was the limited availability of dentists. Another limiting factor was the cost of dental treatment which some residents do not afford. The Pamoja Programme involved also a research component, whilst Amchi Programme involved purely clinical work. Due to the remote location, project-running costs for the Amchi Programme were higher compared to Pamoja Programme.

Conclusions: With regard to organising dental volunteer programmes, it is essential to understand the population’s needs, barriers to access and associated socioeconomic factors that contribute to oral health care. Investigating the benefits and the difficulties encountered these projects can improve and enhance future initiatives organised by dental students.
Introduction: Nowadays, human dissection is questioned, arguing that it can be replaced with electronic devices that support anatomy learning. Dissection activity developed in the Surgical and Functional Anatomy Laboratory, at the UIC BACELONA Faculty of Dentistry, can become a process of professional and knowledge maturity.

Objective: The aim of this study is to evaluate that change, by the asses of a validated questionnaire, and also to determine which are the paths to follow to increase learning benefits during anatomy dissection course. We want to determine the background of the issue, and to determine how should be the questions that will be perform in a future study.

Methods: Participants of the study will be first-year dental students undertaking the head and neck anatomy subject at the International University of Catalonia Dentistry Faculty; and dental students on the second year of their dental studies. All of them will answer a questionnaire (total of ten questions) asking for their perception of the personal benefit, working group benefit, professional skills development, personal sensation between study on plastic model or cadaver material, etc.

Essential Results/Conclusion: We will try to find how the students considered the period of dissection as a positive of the anatomy course, as it is reflexed on literature. The study will confirm that some attitudes change upon the student during the course, helping not only in the academic growing, also contributing to the training of more empathetic future practitioners.

Keywords: dissection, attitudes, anatomy, dentistry, dental students.
Introduction: The Learning Styles (LS) are a tool that helps understand how students learn and whose knowledge allows for reinforcing the professionalism of the teacher. It has been described that professors tend to teach according to their own LS, which can lead to an unconscious favoritism towards the students with their same LS. This study intends to relate the teaching favoritism (TF) to the determination of the LS of teachers and students in the 5th grade of dentistry in the Total Prosthesis course.

Objective: Describe the association between TF and LS in teachers and students.

Methodology: The Kolb’s Learning Styles inventory was applied to 87 students in the 5th grade of dentistry in the Total Prosthesis course. Three students who did not want to participate were excluded and one for a mistake in the answer. The inventory was also answered by professors of the course, 10 in total, who had to select 3 students of their group, defining them as favorite students. The scores were counted and analyzed statistically.

Results: The predominant LS in the students was the Converger, followed by the Assimilator. The same tendency was observed in the professors. No statistical association was found between the TF and LS of professors and the students they selected (p=0.169).

Conclusions: The predominant LS for professors and students in the 5th grade of dentistry was the Converger, followed by the Assimilator. In this study, no association was found between the TF and LS of students and professors.
Poster Presentation

Poster Title: Student opinion on the cooperative use of Synthesis maps in Dentistry Degree for analyzing the prevention of post extraction bleeding.

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Aim: Using a multidimensional presentation (Mind Meister) that can be shared online by all students simultaneously, is a tool of active learning, which stimulates personal and collaborative work. The concept of mental map, is to develop a topic or question from a central label, different arms deemed to derive from it and turn subtags can continue giving new branches corresponding to a level of development of increasingly specific knowledge.

Materials and Methods: The study was conducted at the Faculty of Dentistry at the University of Barcelona during the development of the subject of Oral Surgery. At the beginning of the course is emphasized on the need to conduct a thorough anamnesis to develop the medical history of the patient and thus to assess the possible risks before instructed and practice some type of surgical treatment, as is a tooth extraction. The researcher (M A S) was in turn the instructor of the course in which students are asked to draw up a "map synthesis" to explore possible actions aimed at the prevention of bleeding post dental extraction. The assessment of student opinion regarding the usefulness map synthesis was performed by an opinion poll from 6 binomial questions and short-answer questions aimed at assessing the perception of students regarding the use of this resource in the future as a tool to study other subjects and a question in which a score is asked to evaluate the educational experience of learning this method.

Results: We present a description of the student responses and the interrelationship between them.

Conclusions: Most students think it's useful for synthesizing a topic, although not routinely would use to study. The program is slow when many people are connected on line at the same time.
Poster Presentation

Theme: Evaluation No 28

Title: King’s College London dental students’ perceptions of factors affecting their progression through dental school

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Aim: To determine King’s College London dental students’ perceptions of factors affecting their progression through dental school.

Materials and Methods: Recruitment e-mails were sent to 554 (251 BDS1 and 303 BDS5) dental students, during the 2012/3 and the 2013/4 academic years, inviting participation in a focus group and / or a one-to-one interview. Every responding student was invited to attend one of the time-tabled sessions, held in a private office. The initial question posed was “can you comment on any factors that you are aware of that have affected progression of students through their dental course?” The interviews were audio recorded and transcribed. The text was coded with the assistance of NVIVO software and thematic analysis undertaken. The focus group moderation, one-to-one interviews, transcription and analysis were undertaken by the same researcher. A second researcher checked the coding and theme development process.

Results: A total of 11 focus groups (five BDS1 and six BDS5) and 15 one-to-one interviews (five BDS1 and 10 BDS5) were conducted. The sessions comprised 55 different individuals, eight participated in both a focus group and one-to-one interview. Data saturation was achieved and 20 hours 28 minutes of audio recording made. The coding process resulted in 105 codes and six themes emerged. The themes, and number of references students made to each one, were; study/supporting study (1174 references), the dental programme (1129 references), personal life (877 references), feelings (521 references), students’ behaviour / differences / interactions (501 references), and assessment (365 references).

Conclusions: Students identified a wide range of factors perceived to affect their progression through dental school. Factors associated with the theme “study / supporting study” were those most frequently cited.
**Poster Presentation**

**Poster Title:** Students’ perception of a new form of education in comprehensive attention to dental health.

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**Aim:** Preventing dental disease and improving oral health are key roles of dental professionals. It is a fact that delivering advice has only weak success in influencing patient oral hygiene. Improving oral health requires applying psychological models and principles of behavioural changes. These competencies have to be developed by students during their formation. The aim of our work was to investigate the students’ perception of a new form of education in comprehensive attention to dental health.

**Materials and Methods:** The course was designed for third year students (n=120). The objective was to identify the mechanisms underlying oral health behaviour and to develop intervention promoting oral health.

For that purpose, we set up a multidisciplinary approach, i.e. periodontology, cariology and paediatric dentistry.

Via the learning platform Moodle, students were assigned a clinical scenario, for which they had to identify obstacles in the care relationship and propose theory-based intervention to improve oral health and patient’s adherence.

An anonymous survey was conducted after the course, where students were asked about their perception of the course.

**Results:** A total of 118 students (males: 44.1% and females: 55.9%) participated to the study. 92.7% of the students found the thematic « comprehensive attention to dental health » interesting and 7.3% very interesting. The concepts discussed were considered new for 19.9% of the students.

93.7% of the students considered the clinical impact valuable or very valuable. They were 82.1% to think clinical implantation sometimes or most of time possible. Finally, they were 87.2% to declare to be willing to promote oral health by these methods in their future professional practice.

**Conclusions:** Given the limitations of a self-administrated questionnaire, our results highlight the need of interactive teaching approach to train dental student to comprehensive attention to oral health concepts.
Aim: The transition between preclinical and clinical cycle has been proved to be a period of great stress for dentistry students. A high clinical self-efficacy perception could have an influence in a better clinical performance of students. To the extent of the authors’ knowledge, there is currently no instrument available for measuring this variable, thus the Clinical Self-Efficacy Scale was developed. This study aims to evaluate the psychometric properties of the Clinical Self-efficacy Scale in dental students of a public university in Chile.

Materials and Methods: This is a quantitative non-experimental and psychometric study. Clinical Self-efficacy Scale was applied to a sample of 169 dental students of a Chilean public university, selected by a non-probability quota sampling and considering students between fourth and sixth year of the undergraduate program. Clinical Self-efficacy Scale was created in English and retro-translate to Spanish. It was submitted to expert judgment through five experts in healthcare education. The scale is a closed answer questionnaire Likert type, which includes fifteen items that are taxed at factors such overcoming complications, adequate patient care and relationship with patients. Each question has five possible answers. In order to obtain evidence about questionnaire’s construct validity an exploratory factorial analysis was performed. It was also calculated a Cronbach’s alpha coefficient to assess the reliability of the measure.

Results: The Exploratory Factorial Analysis through a Principal axis extraction method identified one single factor that was making a global evaluation of self-efficacy in dental students. This factor showed a reliability of alpha=0.90, considered as excellent.

Conclusions: The Self-Efficacy Scale presents evidence of validity and reliability to measure the overall perception of clinical self-efficacy in Chilean dental students. But also there is an evident problem in the population to assess their own performance analytically.
Aim: Oral cancer is one of the most common neoplasms and it is responsible for 2-3% of the total of human malign tumours. Early diagnose represents an advantage for improving the survival rate by reducing the diagnostic time. However there are few papers that allow to a regular dental student to have the ability to identify such lesions in the dental office.

Materials and Methods: The development stages of oral squamous cancer are presented from the histological point of view. However, this evaluation method is invasive. This is the reason that optical coherence tomography and fluorescence were used.

Spectral Domain Optical Coherence Tomography (SDOCT) was employed to evaluate the squamous cellular carcinoma. The system was working at 870 nm and it is completely non-invasive.

The validations were performed by VELscope® Vx Handpiece which emits a safe, visible blue light into the oral cavity, which excites the oral tissue and causes it to fluoresce. Abnormal fluorescence patterns aid the clinician in detecting unhealthy mucosal tissue that sometimes cannot be seen with the naked eye. Such patterns arise from a variety of causes: an increase in metabolic activity in the epithelium; a breakdown of the fluorescent collagen cross-links in the connective tissue layer beneath the basement membrane; an increase in tissue blood content, either from inflammation or angiogenesis (haemoglobin strongly absorbs fluorescence excitation [blue] and emission light [green]); the presence of pigments (e.g., melanin or amalgam particles) which absorb light.

Results: Based on the preview evaluations, the dental students can learn to identify the aspects on OCT and VELscope of the successive stages of this type of lesions during the normal inspection in the dental office, in a non invasive manner.

Conclusions: Non-invasive methods, presented in early dental education curricula could act as a valuable tool in identification the squamous cellular carcinoma.
Poster Presentations: Faculty Development
Poster Presentation

Theme: Faculty Development No 1

Poster Title: Basis of Pedagogical Content Knowledge in Dental Education

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Aim: To describe the Pedagogical Content Knowledge (PKC) construct and its relationship with dental education.

Materials and Methods: A literature review based on Shulman’s researches was conducted to comprehend the basis of PCK and its relationship with dental education.

Results: According to Shulman, Faculty builds educational practices on four types of knowledge sources: academic training in specific disciplines, specialized literature reading, structures and educational materials and knowledge derived from teaching practice. These sources subsidize seven categories of knowledge base content: educational content, general teaching, curriculum, educational context, objectives and students. Reflection carried out by the Faculty can be seen in an Action Model and a Pedagogical Reasoning. This model describes the process of reflection and action in six phases: understanding, processing, teaching, evaluation, reflection and new ways of understanding.

Conclusions: The PCK is a powerful construct to help understand how dental school Faculty transforms the technical and scientific knowledge in a better understanding structure for the students.
Poster Presentation Theme: Faculty Development No 2

Oral Title: Preparing Junior Faculty Members for Careers in Academics

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Aim: Dental schools are facing a shortage of graduates committing to full-time academic careers. New faculty members interested in pursuing this path are typically asked to teach with no formal training in educational philosophy and pedagogy. This is especially pertinent at a time when we have a new generation of students, major technology advances and an explosion in access to information. There are several formal faculty development programs that faculty can participate in to improve their skills. Apart from obtaining a Masters in Education, the ADEA (American Dental Education Association) Gies Foundation Academic Dental Career Fellowship Program aims to stimulate predoctoral and postgraduate students’ interest in an academic career. ADEA and Academy of Academic Leadership (AAL) organize programs to support current faculty members to adapt to current challenges. The aim of this project is to describe various formal programs available in the United States (US) to support dental educators to prepare them for an academic career.

Materials and Methods: The authors conducted a web search for year long programs at US dental schools and also looked at ADEA and AAL programs.

Results: ADEA and AAL offer training for allied health educators, Chairs and Academic Administrators Management Programs (CAAMP), Compass Program for Academic Advancement and the ADEA/AAL Institute for Teaching and Learning (leading to a dental educator’s certificate and Master degree). New York University and Case Western Reserve University have developed year-long “in-residency” programs for dental educators.

The “Dental Education Teaching and Learning Academy” Fellowship Program offered at Tufts University School of Dental Medicine has been designed to foster the development of dental educators. The three pillars (teaching, research and service) that are outlined in the program follow the guidelines and recommendations proposed by ADEA.

Conclusions: There is a significant interest to support dental educators to successfully navigate the current academic landscape with the identified challenges.
Poster Presentation  

**Poster Title:** Educating Specialists in Paediatric Dentistry in the Triage Process  

**Author:** *Foley J¹  

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**Aim:** To determine agreement amongst Specialists in Paediatric Dentistry following educational opportunities in a re-defined clinic triage process and the implementation of triage descriptors.  

**Materials and Methods:** Approval was granted by the local Clinical Governance Committee. Fifty new patient referral letters were randomly selected by the Principal Investigator (PI) from those received by the Waiting Times Office. Letters were scanned and e-mailed to all Specialists in Paediatric Dentistry within the region (n = 5). Audit One: Triage completed according to current practice for clinic allocation. Audit Two: Feedback on results and training in a re-defined triage referral pathway were completed. The same 50 scanned letters were randomised in order using a sequence generator and letter triage was completed according to the new pathways. Audit Three: Feedback on results and triage descriptors for clinic allocation were developed and disseminated amongst the group. Following further sequence generation, the same 50 referral letters were randomly-ordered and re-sent for triage according to the previously re-defined referral pathways. Agreement amongst Specialists were reviewed according to clinic triage and the urgency of clinic appointment.  

**Results:** Overall, agreement amongst the Specialists for clinic triage for the letters was as follows: Audit One: 18/50, Audit Two: 24/50 and Audit Three: 26/50. In relation to the urgency of clinic allocation according to the referral letters, agreement amongst the Consultants/Specialists was as follows: Audit One: 28/50, Audit Two: 43/50 and Audit Three: 44/50.  

**Conclusions:** Educating Specialists in the triage process resulted in an improvement in agreement concerning clinic allocation and the urgency of appointment. Further educational opportunities and refinement of triage descriptors is required to ensure near-perfect agreement amongst triaging clinicians.
Title: Globalization: Changes in Interest in Educational Research as Measured by Submissions and Acceptances to the Journal of Dental Education.

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Aim: The Journal of Dental Education (JDE) is a peer-reviewed monthly journal that publishes a wide variety of educational and scientific research in dental, allied dental and advanced dental education. The JDE has been published by the American Dental Education Association since 1936. In the middle of 2012 the JDE started managing manuscripts through a web-based journal submission and management platform called Scholar One®. The aim of this study is to present metrics on International submissions, acceptances and rejections from 2013-2015.

Materials and Methods: The Scholar One® data-base was searched for all manuscripts that were submitted for the years 2013, 2014 and 2015. Reports for total number of submissions, acceptances and rejections by country and general accept/reject ratios were generated.

Results: Results: The top five countries in the order of total submissions from 2013-2015 were the USA(546), India(234), Brazil(86), Saudi Arabia(83) and Canada(49). The top five countries in order of “accepted” manuscripts from 2013-2015 were USA(285), Canada(22), Saudi Arabia(10), U.K.(9) and Australia (8). The top five countries in “rejected” manuscripts from 2013-2015 from 2013-2015 were U.S.A(261), India(231), Brazil(81), Saudi Arabia(73) and China(44).

Conclusions: The JDE receives approximately 500 manuscripts per year. The top submissions come from the USA. There are a high number of manuscripts that are submitted from India, Brazil, Saudi Arabia and Canada. Despite these high numbers, the acceptance rates for these countries (except for Canada) remains relatively low. Faculty should be exposed to the quantitative and qualitative methods used to conduct rigorous educational research. There is a need for faculty development in the area of educational research in many countries to improve the quality of publications.
Title: First experiences as a Best Evidence Medical Education reviewer - what’s it really like?

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Aim: BEME reviews are the highest-standard, peer-reviewed reports of evidence available relating to medical and health professions education (Ref 1). Undertaking a BEME review is academically stimulating and interesting but also highly challenging, even with the support of an experienced inter-professional team. This work describes some of those challenges and some handy tips to ease the novice (dental) reviewer through the early stages of a BEME review.

Materials and Methods: This presentation is informed by my first two experiences of BEME, firstly as a reviewer (Ref 2) and now as a Group Leader (Ref 3). The essential stages of creating a successful BEME protocol such as recruiting the right team, selecting a suitable question, defining the limitations of the search and creating inclusion and exclusion criteria will be described.

Results: A number of tips that our team found helpful through the day-to-day, month by month development of a BEME review will be shared including a suggested list of questions to discuss at the first three review team meetings.

Conclusions: Managing the BEME review process and the associated data requires considerable time and support from information scientists. Sharing good practice and areas for improvement from recent review experience is important to create efficient, effective review teams.

Take home messages: Spending time with colleagues who have previous BEME review experience was crucial to the success of our review. Further discussion of the process in a ‘Free Stage’ setting would be helpful to both our current review and the valuable work of the BEME collaboration.
Poster Presentations: Inter-professional Education
Title: Interprofessional oral health care: educating future dental, medical and nursing professionals

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Aim: Collaboration between dental, medical and nursing professionals in oral health (OH) maintenance is essential to provision of comprehensive patient care, especially in those with special health care needs. This study investigates the extent of teaching of Special Needs Dentistry (SND), OH and Interprofessional Education (IPE) in Malaysian and Australian dental, medical and nursing institutions, as well as educators’ perception of educational development of respective disciplines, in preparation for interprofessional OH practice.

Materials and Methods: The Deans of Dental Schools (Malaysia: n=6, Response rate=100%; Australia: n=9, Response rate=88.9%) were invited to complete a postal-based questionnaire survey regarding SND education. Additionally, an audio-recorded semi-structured phone interview was conducted among the Medical Program Directors (Malaysia: n=9, Response rate= 81.8%; Australia: n=7, Response rate=35%), and the Undergraduate Nursing Program Coordinators (Malaysia: n=5, Response rate=71.4%; Australia: n=12, Response rate=33.3%) to gain information on OH and IPE. Questionnaires used were developed based on existing literature and had been content-validated. Qualitative data was analysed via deductive and inductive qualitative approaches. Quantitative data was analysed using SPSS.

Results: SND teaching was offered in 16.7% (n=1) of Malaysian and 75.0% (n=6) of Australian dental schools. 44.4% (n=4) of Malaysian medical schools offered dedicated teaching hours in OH. Integrated OH teaching offered in all Malaysian and Australian medical and nursing schools lacked structured learning objectives, teaching methodologies and assessment approaches. IPE with OH involvement was minimal in Australian medical and nursing schools, and non-existent in Malaysia. Educators expressed having inadequate expertise, patients and facilities as well as curriculum overload as common barriers in conducting teaching in SND, OH and IPE, but were supportive of such training.

Conclusions: Findings of this study provide useful information that will direct the local and global development of healthcare education and practice that promotes interprofessional OH care.
Aim: Routine dental prophylaxis is a common procedure in both veterinary and dental practice. Learning clinical skills depends on repetitive practice, ideally in an environment without undue stress (Ref 1). This study describes an inter-professional approach to increase the authenticity and practicality of a low-cost model for use within a veterinary clinical skills laboratory.

Materials and Methods: A low-fidelity model using ceramic tiles, silicone sealant and filler to emulate teeth, gingivae and calculus respectively has previously been shown to be helpful for the acquisition of foundation-level veterinary dental skills (Ref 2). Dental and veterinary colleagues shared experiences of teaching dental skills including the diagnosis of periodontal disease and how to remove dental plaque and calculus in an effective and safe manner, which informed development of the model.

Results: The model, along with an instruction booklet, was introduced as a clinical skills station. Hints and tips from teaching skills to dental undergraduates have been included in the accompanying booklet. Students were able to practice their dental skills and also recreate the model for another student following instructions within the booklet. This is essential for self-sustaining resources, a priority for a cost-effective clinical skills laboratory. Whilst the booklet and model were not designed for stand-alone teaching of dental skills, they enabled students to practice these skills in a safe setting.

Conclusions: Sharing ideas and experience inter-professionally has led to an enhanced dental model that can be cheaply and easily produced. Reviewing the process of teaching clinical skills in this way highlighted areas for improvement and increased engagement for dental students.

Take home message: Spending time with colleagues from related disciplines helped to refine resources for teaching dental skills whilst allowing useful insight into the working worlds of others across our Faculty of Health Sciences.
Title: Should health-care professionals receive education on oral and dental health?

Author: Holbrook, P.

Affiliations: University of Iceland

Aim: Collaboration between the various health care professions is increasingly important. This study aimed to assess areas of dental and oral health education that could be of benefit to students in other health care disciplines.

Materials and Methods: The curricula in the School of Health Sciences of the University of Iceland were reviewed with particular respect to areas where possible collaboration in teaching and research between the dental school and other health care disciplines could be beneficial.

Results: The increase in life expectancy and retention of some teeth throughout life has changed the need for the understanding of oral health by health-care professionals. Recognition of gerodontology and oral medicine as specialist areas in dentistry has opened up links to other health-care disciplines. While increasing use of dental implants is an important improvement in oral health it sometimes requires more understanding outside the dental area. Saliva and numerous dietary factors are important in cariology, tooth erosion and general health in most age groups. The periodontal-systemic connection is an area of research requiring collaboration between health care disciplines. Necessary oral and dental treatments for patients with special needs is an area that clearly needs inter-disciplinary collaboration. Collaboration between faculties of dentistry and pharmacy covering basic teaching and some research has lead to drug developments and clinical trials that illustrate possible benefits. An inter-disciplinary group has now been set up to broaden clinical training.

Conclusions: Clearly the oral cavity is part of the body and there is a clear need to produce suitable teaching material on oral and dental diseases and their treatments that could be used to enhance the learning of students in other health care disciplines.
**Poster Presentation**

**Theme:** Inter professional Education No 4

**Title:** An Inter-Professional Undergraduate Dental Curriculum: The Student's Perception

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**Aim:** According to the General Dental Council (UK) ‘The quality of teamwork is closely linked to the quality of care the team provides. It is important that potential registrants...have the opportunity to develop in a team environment as early as possible in their training’ (Preparing for Practice 2015). In response, Peninsula Dental School have developed an innovative approach to dental education; the BSc Dental Therapy and Hygiene (DTH) and Bachelor of Dental Surgery (BDS) courses are fully integrated during year one in order to encourage effective team-working from the outset. The two programmes overlap in their scope of clinical practice and the underpinning biomedical sciences. First year cohorts share learning outcomes, teaching sessions and assessments. Student feedback is essential to inform the future direction of this inter-professional undergraduate curriculum.

**Materials and Methods:** Focus groups were facilitated at the end of the first year for DTH students. Students were asked open ended questions about the positive and negative aspects of integration and inter-professional engagement.

The students’ responses were recorded and placed into themes.

**Results:** Responses were categorised into the following themes:

- Level of biomedical knowledge required
- Respect between BDS and DTH colleagues
- Effectiveness of team working to patient care
- Understanding roles and Scope of Practice of the dental team in shared care
- Confidence in the integrated environment

The majority of responses were positive, particularly with respect to building alliances with BDS students however, students perceived staff acceptance and understanding of the benefits of an integrated curriculum could be further developed.

**Conclusions:** The feedback indicates that students view the integrated curriculum positively, suggesting that early inter-professional education and collaborative practice develops team working skills and relationships.
**Title:** New Frontiers for Biomedical Science in Oral Curricula: The Needs of Emerging Dental Professions

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**Background:**
The UK government has proposed changes to the delivery of oral healthcare. Current figures indicate that dentists provide 80% of treatment, compared to 20% provided by Dental Care Professionals. This ratio is expected to shift to 50:50 by 2025 (Centre for Workforce Intelligence, 2014). Workforce projections indicate that the demand for dental hygienist/therapists (DHTs), who will provide a large proportion of this care, is expected to exceed supply in the next 9 years.

In 2013, the requirement for DHTs to work entirely under the prescription of a dentist was removed. Under 'Direct Access', there is a shift of accountability for treatment planning from the dentist to the DHT. This regulatory change has been reflected by an increased overlap in the learning outcomes in the General Dental Council’s ‘Preparing for Practice’ document for both DHTs and dentists.

In 2014, Peninsula Dental School welcomed its first cohort of BSc DHT students on an innovative, inter-professional undergraduate programme.

**Aim:** To prepare all dental graduates for shared care and collaborative practice, and ensure that DHT biomedical science knowledge is at the level required for Direct Access regulations.

**Materials and Methods:** The BDS and BSc DHT programmes are fully integrated in year one.

**Results:** Overlap in scope of practice means that clinical activity and the underpinning biomedical sciences can be taught to both programmes simultaneously, providing several advantages: Team working and collaborative practice is developed early on, existing academic and clinical expertise can be utilised and resources can be shared. However, pre- and mis- conceptions by students, staff and clinicians can lead to bias, and the breadth of prior knowledge increases with a multi-programme cohort.

**Conclusions:** To meet the demands of a changing population, the model of dental care is evolving. An inter-professional undergraduate curriculum instils team working values from the outset - integration is key to future-proofing the workforce.
Background: Recently, dental hygienists have more roles to maintain oral hygiene of elderly in collaboration with dentists in Japan. School of Dentistry and School of Oral Health Care Sciences in Tokyo Medical and Dental University decided to implement a new course as an opportunity to develop students’ attitude for IPW.

Aim: In this study, we carried out a trial course to find out students’ awareness and achievements in collaborative work. We investigated points to be improved in the framework to establish a new IPW course.

Materials and Methods: From May to July, 2015, as volunteers, 8 Dental(D) and 16 Oral Health Care Sciences (OH) students participated in a collaborative trial on a patient for Supportive Periodontal Therapy. A dental student and 2 OH students became a team for a patient and had 2 appointments together. All students were asked to fill questionnaires regarding IPW. Data were analyzed quantitatively and qualitatively.

Results: We collected data of 7 (87.5%) Dental and 13 (81.3%) OH students. Results in quantitative analysis were: A trial was, “Beneficial opportunity to develop a good communication with other professions” (D: Yes (100%), OH: Yes (84.6%), Rather Yes (15.4%)), “Beneficial opportunity to design treatment plan together with other professions” (D: Yes (85.7%), Rather Yes (14.3%), OH: Yes (69.2%), Rather Yes (30.8%)). In qualitative analysis, dental students seemed to recognize the importance of IPW by “understanding the role of each profession, good communication, sharing patient information”. OH students raised “understanding role of each profession, good communication, sharing information and establishing mutual trust”.

Conclusions: Through participating in this trial, both students understood the objectives and identified factors important in improving their attitude toward IPW. We confirmed this trial would be a framework for a new course for IPW for students at School of Dentistry and Oral Health Care Science in TMDU.
Poster Presentations: Teaching Methods
**Title:** Dental students’ opinion of the quality of clinical supervision

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**Aim:** This study was designed to evaluate the final year dental students’ perceptions of clinical supervision at different clinical placements.

**Materials and Methods:** An anonymous and voluntary structured survey was conducted among a cohort of final year Bachelors of Dental Science and Oral Health students to evaluate their perceptions of clinical supervision at the university hospital (CP1) and eight clinical outplacements (CP2 - CP9) as part of the mandatory ‘outreach’ program. The following clinical supervisor skills were evaluated: communication skills and rapport, organisation and time management, provision of feedback, conducting student assessments, promotion of self-directed learning and teaching methods and style. The students’ satisfaction with the quality of supervision was rated on a 5-point Likert scale; the higher numbers indicate greater agreement with satisfaction statements. The survey was conducted on the last day of the academic year based on the previous 6 months of their clinical experience to minimise recall lapse in memory. CP1 was used as the benchmark. Paired t-Tests were performed to compare students’ satisfaction with clinical supervision. The comparison between each clinical outplacement and benchmark (CP1) was based on the themes identified.

**Results:** The overall mean score (3.74) indicated a positive students’ response with clinical supervision at all clinical placements. Two outplacements (CP2 and CP3) showed consistently higher scores than the university hospital in all the themes considered.

**Conclusions:** Students’ opinion about their clinical supervision varied noticeably between outplacements. It is interesting to note the two placements located in the regional areas performed well above the benchmark even though the latter offers comparatively more academic oversight and opportunity to practice specialities such as fixed prosthodontics.
Poster Presentation  

Oral Title: Role-playing as an instructional technique for the application of acquired knowledge in a curriculum in Dental Materials

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Aim: To evaluate second-year undergraduate student’s satisfaction after the implementation of role playing as an instructional technique in response to the needs of finding a practical application of acquired knowledge in Dental Materials curriculum.

Materials and Methods: A role-play exercise was designed. A total of 52 students participated in the activity and were randomly divided in 4 groups: A (ceramics), B (composites), C (orthodontic wires) and D (dental implants). Each group was also divided in 2 subgroups. A clinical situation was presented to students in groups A and B who acted as practicing clinicians. Each subgroup had to reach a consensus about a fictitious product being the best for the specific clinical situation and assigned dental material, and convince patients (rest of the class). In the same way, students in groups C and D acted as product managers trying to sell their best possible fictitious product to dentists (rest of the class). In each case, the rest of the groups voted for the most convincing product between the two presented alternatives.

Learner’s satisfaction was tested with a survey that included five groups of multiple-choice questions to be answered with a 5-point Likert scale regarding the facilitators, impact of the content, role playing as instructional method, overall satisfaction and four open questions for further feedback.

Results: Role-playing provided an opportunity for students to apply the acquired knowledge by experiencing different roles (dentists, patients and product managers for dental materials companies). It resulted in an efficient, low cost and learner-centered instructional method. All students completed the questionnaire demonstrating high satisfaction for each independent category.

Conclusions: The role-play instructional method was validated by a satisfaction survey completed by the participants at the end of the activity, offering an example of a practical approach for the application of knowledge of dental biomaterials in early years of dental studies.
Title: Introducing a PBL course in a teacher-centered curriculum

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Aim: Problem Based Learning (PBL) has been introduced to several dental schools across the world, however, in some Eastern European dental schools, the main form and framework of education is still the traditional teacher-centered approach. To introduce an entirely student-centered curriculum necessitates profound changes, wherefore most universities do not even start the process. The aim of this investigation was to find out about how a student-centered single PBL course could work and function in such an environment and what the ideal group size would be.

Materials and Methods: Two groups of fourth year dental students were selected randomly. Students were divided into a group of four and a group of eight. One (the same) facilitator was present in all sessions. During the first PBL session a complex case was presented, with pictures of the patient, x-ray documentation and medical history. The task was to come up with complex treatment plans. The group of eight was divided into smaller learning groups (3-3-2). After one week, students had to present their proposed plans. Students were then given the task to collect and categorize all the information heard at the second session, and finalize three treatment options for the patient. After the last session, all students had to fill in a questionnaire and record individually a three minute video report about their satisfaction with the course.

Results: All students were highly satisfied with this novel approach. The course was above their expectations, and almost all of them asked for further sessions.

Conclusions: It is possible to integrate one single PBL course even in a teacher-centered environment for a start on the way to student-centered education.
Poster Presentation  

Theme: Teaching Methods No 4

Title: Critically Appraised Topics as a method to facilitate evidence-based practice in dentistry

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Aim: To describe the implementation of Critically Appraised Topics (CATs) in the Master Degree of Oral Surgery and Implantology of the School of Dentistry of the University of Barcelona, and to assess students’ perception after a 6-month period.

Materials and Methods: Prior to the start of the course, the teaching staff made 66 clinical questions including several topics like dentoalveolar surgery, implantology, oral medicine, laser and temporomandibular disorders. Each clinical question was rephrase using a PICO structure by students. Then the postgraduates had to select, summarize and appraise the 5 most relevant papers on the issue, and classified them according to the degree of recommendation using the SIGN criteria.

An electronic survey was sent by email to all the Master Degree program on Oral Surgery and Implantology students, in order to know their opinion and perception about the bibliographical sessions. A descriptive analysis was made.

Results: Fifteen students (100%) filled the survey. The median overall score of these bibliographical sessions involving CATs was 8 out of 10 (IQR: 1). The highest rated aspects were the improvements in critical review of literature, methodology and dental knowledge. On the other hand, students complained that some of the issues had little clinical applicability.

Conclusions: CATs are a practical patient-specific evidence-based tool for learning and applying critical appraisal skills. Repeated exposure of students to the required steps involved in writing a CAT will provide critical lifelong learning skills, which can ultimately lead to an improvement in oral health care for the public. In general, postgraduate students find this method very useful.
Title: Optimising Skill-mix in Dentistry in the UK: A Logic Model.


Affiliations:

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Aim: Studies across the UK’s health service reveal benefits of developing skill-mix. We have yet to establish how to optimise the skills of the dental team to achieve best service delivery. Adopting a realist approach (1) in this study, funded by Health and Care Research Wales, we used research literature on UK dental therapists to build a theory about what works, why, for whom and in what circumstance.

Materials and Methods: The logic model was derived from a structured review of the literature. We searched databases using key words for UK-based research papers. Following the realist approach (1), papers were coded for high-level factors describing the conditions or context (C) under which the mechanisms (M) operate to produce desired outcomes (O). Coding was verified via cross-coding by three team members.

Results: We coded 37 papers. Context factors were classified as external or internal. External barriers and enablers were outside the dentist’s control, e.g. patient factors, workforce supply and demand, funding levels, scope of practice, and policy context. Factors including business cases and payment, dentists’ views and knowledge of skill-mix, dental therapists’ views on delegation, practice factors, teamwork, leadership, and patients’ trust were context factors internal to the dental practice. Mechanisms related to process factors, e.g., referral protocols, training, experience, staffing levels, funding mechanisms. Outcomes were separated into outputs and impacts. Outputs operated at individual and practice level (patient-related factors, costs, operational, activities, team benefits) while impacts operated at population and system level (benefits to the patient, dental service provided, the dental profession).

Conclusions: Our analysis provides theory about the context and mechanisms needed to facilitate the work of dental therapists and what outcomes dental therapists facilitate. The theory will be tested in a set of dental practices aiming to educate on skill-mix delivery of oral healthcare.

**Poster Presentation**

**Poster Title:** A Survey of Paediatric Dentistry Teaching within Dental Therapy Programmes within the United Kingdom

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**Aim:** To assess didactic- and clinical skills teaching of conventional- and alternative treatment techniques for the management of dental caries in Paediatric Dentistry in undergraduate Dental Therapy Schools across the United Kingdom.

**Materials and Methods:** A structured on-line questionnaire was developed using SurveyMonkey®. The survey link was e-mailed to all Teaching Leads for all 22 Dental Therapy Schools throughout the United Kingdom. A reminder e-mail was sent four weeks after survey launch. The survey was open on-line for three months.

**Results:** Data were obtained for 20 Schools. Regarding didactic conventional teaching, 19/20 schools taught single-surface restorations for both dentitions, 18/20 and 19/20 schools taught multi-surface restorations for the primary- and permanent dentitions respectively and 17/20 and 4/20 schools taught pre-formed metal crown placement (PMC) for the primary- and permanent dentitions respectively. Concerning conventional clinical skills teaching, 17/20 schools taught both single- and multi-surface restorations for both the primary- and permanent dentitions whilst 17/20 and 2/20 schools taught PMC placement for the primary- and permanent dentitions respectively. Regarding didactic teaching of alternative treatment techniques, 16/20 and 17/20 schools taught both partial caries removal and restoration/ no caries removal and fissure seal for the primary- and permanent dentitions respectively and 17/20 and 1/20 schools taught the Hall technique for the primary- and permanent dentitions respectively. Concerning alternative techniques within clinical skills teaching, 13/20 schools taught partial caries removal and restoration for both dentitions, 15/20 schools taught no caries removal and fissure seal for both dentitions and 14/20 and 5/20 schools taught the Hall technique for the primary- and permanent dentitions respectively.

**Conclusions:** Both conventional- and alternative treatment techniques for the management of dental caries within Paediatric Dentistry appear to be taught within Dental Therapy programmes within the UK. Teaching of the use of PMC placement appeared to be less popular for the permanent dentition.
Poster Presentation          Theme: Teaching methods No 7

Poster Title: Comparison of case based and lecture based learning efficiency in orthodontics among undergraduate dental students with different personality traits

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Aim: The aim of this study is to compare case based and lecture based learning efficiency in orthodontics among undergraduate dental students with different personality traits.

Materials and Methods: Forty-seven dental students at the fourth year were included in this research. First a lecture based course was given and then the students were randomly assigned into 5 groups. Each group was provided with relevant diagnostic records of a specific mixed dentition case requiring corrective orthodontic treatment. The students were allowed 3 weeks to prepare a presentation including the problem list and treatment plan. A resident from the Department of Orthodontics was assigned for each group to observe the progression of the projects. Orthodontic diagnosis and the treatment plan were discussed within group members at the end of each study week. At the end of the study period, each group presented their cases to the other students and the instructor. Following the last presentation, a questionnaire was given to evaluate the effectiveness of case based and lecture based learning. To evaluate the students’ personality traits, the 50-question version of the big five personality traits (BFPT) and Ten-Item Personality Inventory (TIPI) questionnaire were distributed to each student.

Results: Thirty students agreed or completely agreed that case based learning is more effective than lecture based learning, in contrast to 11 students who agreed and completely agreed that lecture based learning is more effective than case based learning. On the other hand, no statistically significant correlation was determined between personality traits, and the preference of the learning methodology (p>0.05).

Conclusions: Case based learning is more effective than lecture based learning in terms of developing a problem list, an orthodontic diagnosis and a treatment plan. On the other hand, the selection of case based learning as a more efficient means of education is not directly related with the students’ personality traits.
Title: Does science knowledge learnt in problem or enquiry-based learning sessions transfer to other learning spaces?

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Aim: This study will evaluate if knowledge gained through enquiry-based learning sessions transfers to other settings.

Materials and Methods: Enquiry-based learning (EBL) and problem-based learning (PBL) have been used in dental education over the past 20 years and use a patient case scenario to stimulate learning in a small group setting, where a trained facilitator does not teach but guides the group to bring about deep contextualized learning. Peninsula Dental School (PDS) uses an integrated learning environment with enquiry-based learning scenarios as the overarching pedagogy, with all learning centred on each case scenario. All other learning platforms, such as e-learning, plenary lectures, workshops, the Simulated Dental Learning Environment (SDLE), Life Science Resource Centre (LSRC) and patient clinics, are timed and delivered to support the learning objectives of each individual case scenario.

As part of a quality assurance of EBL at PDS, a questionnaire was delivered to all dental and therapy and hygiene students (n=209), and one question asked students whether what they learnt in EBL sessions helps them in other teaching sessions, for example, LSRC, SDLE, plenaries and workshops.

Data analysis used thematic analysis of the free text answers.

Results: Preliminary results show that the opportunity to discuss topics in the safe and supportive environment of an EBL session helps learners to feel confident and consolidate knowledge in other teaching spaces. Learners benefit from sharing resources and learning collaboratively in EBL sessions, which they then transfer to other settings.

Conclusions: Learners appreciate they individually perform better when they actively participate in EBL sessions and that sharing resources and learning during these sessions is one of the benefits of them.
Poster Presentation  

**Oral Title:** Evaluating the Daybook. Long distance view of the educational impact of a teaching and learning resource; linking pedagogy to practice

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**Aim:** Daybook is the innovative case-based learning resource integrating multiple evidence-based adult learning pedagogies within an enquiry-based learning (EBL) setting developed for the final year of a BDS programme.

Evidence suggests that for newly qualified dentists to develop into truly independent practitioners, they should be trained for capability and employability, in addition to competence. Daybook has been designed to educate for these and provide a foundation for lifelong learning.

The aim of this study is to investigate the views of previous Daybook users relating to aspects of preparedness for employability; independent practice; building of capability; and sustained impact of learning, after 2, 3 and 4 years in the ‘real world’ of dentistry. We aim to provide evidence to support development and ongoing use of Daybook, both internally and potentially in other national and international curricula.

**Materials and Methods:** The views of graduates from 2015, 2014 & 2013 (n= 194) who were still registered with a professional body and practising dentistry, were sought via an online Survey Monkey© questionnaire regarding the impact of Daybook on their preparedness for independent practice in the ‘real world of dentistry.’

**Results:** Results indicate that Daybook supports graduates to be prepared and capable of independent practice following initial registration and in their continued development to expert. The underpinning pedagogical and theoretical framework is clearly linked to this support, and suggests impact is sustained into clinical practice employment

**Conclusions:** Findings will inform meaningful and sustainable curriculum development for future cohorts internally and provide a framework for learning in other clinical settings. The impact of this study will lead to improvement in the overall student experience, relevant to the wider field of medical and interprofessional education.
Title: Engaging Dental Students in Technology using 3D Scanning and Printing.

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Aim: Our aim was to use students’ interest in new technologies to enhance their learning experience of fundamental oral anatomy and tooth morphology, simultaneously increasing their technological fluency in 3D imaging and printing. A University of Melbourne Engagement Initiatives Grant provided funds for this project.

Materials and Methods: A Bruker MicroCT scanner (1172) was used to create microCT scans of various small animal skulls and human teeth. A David SLS3 surface scanner was used to create surface scans of a variety of human dentitions, and a Zortrax 3D printer was used to create 3D prints of a number of scans (both from inhouse scans and downloaded from Thingiverse.com). Skyscan software was used to manipulate microCT scans and create 3D models. 3D Slicer was used to create 3D models both from cone beam CT scans and MRI sample scans.

Scans and models were used in the curriculum to demonstrate aspects of oral and comparative anatomy. Both the surface scanner and 3D printer were installed in a location visible to the students during their practical classes.

Results: 3D scanning and printing was used to increase student engagement with the process, and the benefits of using this technology in future dental practice. This broadened students' knowledge of emerging technologies which are excellently suited to dentistry, and integrated into the curriculum an interest and engagement with this new technology, and reinvigorates an appreciation of oral anatomy and comparative odontology. Increased engagement will be measured using the Student Experience Survey distributed to students at the end of the subject.

Conclusions: Student engagement with new technology allows them to experience innovative uses of technology to study the sciences involved in dentistry. Integrating uses of new technology into the existing curriculum is an ideal way to maintain knowledge of the technology at the forefront of development.
Poster Presentation

Theme: Teaching methods No 11

Poster Title: Changes of oral health-related knowledge after an interactive education lesson led by dental students, among teenagers included in Erasmus+ “Come4You” project

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Aim: Assessment oral health knowledge after an interactive experiential education lesson in a group of teenagers from Bucharest.

Materials and Methods: In November 2015 was implemented the first oral health lesson from a series of three, inspired from oral health model in Sweden, on 63 subjects from experimental group included in Erasmus+ project.

The ethical approval from University and the consent from parents were obtained. Mean age was 14.3 (±1.6), among which 30.2% were boys. Oral health knowledge was assessed at the beginning of the study and after the first lesson, using a self-administered questionnaire, with 37 opened and closed items. The lesson took place in the classrooms, in small groups, sustained by dental students trained at Karolinska Institutet and supervised by teaching staff.

Topics of education were: causal chain of decay, risk and protective factors for tooth decay and proper tooth brushing technique.

Results: Regarding oral hygiene knowledge, statistically significant differences were found in terms of subjects knowing about the proper brushing technique: 4.8% before and 63.5% after the lesson, z= -6.083, p=0.00; subjects knowing about the importance of fluoride toothpaste: 31.7% before and 76.2% after, z= -4.95, p=0.00 as well as the role of the tooth brushing: 81% before and 93.7% after, z= -2.63, p=0.011. Improvements were also found in other aspects, but not statistically significant, regarding the importance of oral hygiene in the prevention of decay: 77.8% before and 84.1% after, z= -1, p=0.317, role of dental floss: 66.7% before and 77.8% after, z= -1.941, p=0.052. Regarding dental appointments, more subjects consider it important for prevention (82.5% before and 85.7% after).

Conclusions: Oral health knowledge was increased by the lesson, most significant on tooth brushing technique and role of fluoride.

Acknowledgement: The Erasmus+ project “Youth Community-based Oral Health Learning Model” was cofounded by European Union.
Title: Educational Website For Teaching Dentistry

Aim: To determine whether the use of an educational website helps students in their learning, incorporating certain concepts; and to determine whether the reinforcement learning affects the exam stress.

Materials and Methods: A cluster-randomized controlled clinical trial was designed. A website was constructed about periodontal diagnosis. The test group received reinforcement in their learning by accessing this website. Both groups were examined at the beginning and at the end of the semester. Descriptive statistics [mean and standard deviation (SD)], U-Mann Whitney and paired Wilcoxon tests were used to compare marks from exams in both groups. ANOVA test was used to compare marks among stress groups.

Results: Sixty-one students were included in the study, 22 in the test group and 29 in the control group. No statistical significant differences were found between groups in baseline (p=0.408). The marks of the students of the test group improved significantly during the study [initial marks=5.5 (SD=2.39), final marks 7.42 (SD=1.68); p<0.001], meanwhile in the control group there was not any statistically significant differences in their marks during the study (initial marks=5.93 (SD=2.20); final marks= 5.70 (SD=2.22); p= 0.690). The increase in the marks during the study was significantly higher in the test [1.92 (SD=2.10)] than in the control group [-0.23; SD=3.23] (p=0.027).

No statistically significant differences in exam stress were found between test and control groups. The main differences in marks were found between students at each end of the scale [(baseline: 5.7 vs 7.1) (final: 3.2 vs 5.3), respectively] (p>0.05). The highest improvement was found at the extreme ends students (2.5 & 1.8) versus those with intermediate grades (0.3 & 0.16).

Conclusions: This educational website could be considered an appropriate and formative educational resource for teaching periodontal diagnosis. However, the reinforcement learning does not seem to affect the exam stress.
Poster Presentation  Theme: Teaching methods No 13

Poster Title: Innovating an Infection Control Course with the Flipped Learning Model

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Background: This study concerns the innovation of an Infection Control course at a Korean School of Dentistry, where dense knowledge is typically transmitted through traditional lectures. Faculty members and dentists widely agree the objective of the Infection Control course should be to equip students with a set of infection prevention protocols through application of microbiological and epidemiological knowledge. In the past, however, students have had little opportunity to internalize and apply this knowledge, producing graduates who might endanger patients due to improper infection management.

Aim: Thus, the infection control course must be redesigned to incorporate meaningful and practical learning experiences through which students can apply their understandings of dental science. The flipped learning model could provide an optimum vehicle for this purpose.

Materials and Methods: This study follows the (1) development research method for course development (Richey & Klein, 2005) and uses (2) quantitative data analysis (mean comparison and multiple regression) for learning outcomes measurement.

Results: The flipped learning course innovation is composed of seven two-hour unit lessons. Each week’s content includes relevant video clips and reading materials so that learners study with the resources. At the start of the classroom session, a checkup quiz is administered to ensure that students finish studying the pre-class assignment. Following the quiz, the instructor’s mini-lecture provides about 20 to 30 minutes of review of significant points from the pre-class assignment and introduce the classroom learning activities. The remaining class time is devoted to small and whole group learning activities closely related to the pre-class learning.

Conclusions: Infection control is crucial to ensuring patients’ safety. Though the application of knowledge is more critical than the acquisition of scientific knowledge, the previous courses had emphasized rote learning. This failure to integrate biomedical and clinical science in dental education is a crucial concern, and can be addressed effectively by flipped learning model.
The Experience Of Dental Students’ Participation In Caries Preventive Program Among Moscow Schoolchildren

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Aims: To evaluate the prospect of dental students’ participation in school preventive programs to improve their knowledge and practical skills in preventive dentistry.

Materials and Methods: Methods: Dental students of the second and third years took part in the caries preventive program among schoolchildren. This program has been implemented since 1995 in one of Moscow’s secondary schools. Under the teacher’s supervision the students carry out oral examinations, training of children in oral hygiene skills, topical fluoride application, and sealing of permanent molar fissures. One hundred students, before and after their participation in the program, completed a 50-question test and underwent assessment of practical skills in preventive dentistry (on a five-point scale). Also, prevalence of dental caries in 12-year-olds was compared between the test school’s children and the average school child in Moscow.

Results: Evaluation of students’ knowledge and skills in preventive dentistry demonstrated the following tendency: the mean number of correctly answered questions, before and after participation in the school preventive program, was 76% and 94%, respectively. The mean scores of the practical skills evaluation increased from 3.9±0.4 to 4.6±0.3 (p>0.05). The percentage of 12-year-olds without caries in the test school was 53%, compared to the average child in Moscow, 29%. The mean DMFT values were 0.70±0.18 and 2.45±0.84, respectively (p<0.001).

Conclusions: The participation in the school preventive program promoted improvement of students’ knowledge and practical skills in preventive dentistry and development of communication skills with children. Continuous preventive programs in schools are necessary to decrease prevalence of dental caries among children. Additionally, the involvement of students—in cooperation with staff and dentistry professionals—could yield possible benefits, such as better rapport or more attentive learning, for the children.
Poster Presentation

**Poster Title:** Collating seminars as part of a new learning method in dental pre-graduate education

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**Aim:** The aim of the present study was to evaluate feedback from an advanced learning method including collating seminars in dental pre-graduate education.

**Materials and Methods:** Dental students (n=22) at the Institute of Dentistry, University of Eastern Finland participated in collating seminars during their 5th study year (last semester). The study module consisted of written essays and collating seminars based on multidisciplinary clinical cases. The seminars included oral presentations, discussion with opponents and teachers as well as interactive exam (using interactive presenter). Essays and oral presentations were prepared as group work, while interactive exams were individual. Data for this study were collected after the fifth seminar from the students using questionnaires. Participants were asked to evaluate the study module with the following questions rated from 1 to 5 (1=very little and 5=very much):

- How did the new learning method enhance your learning as compared to traditional essay exams?
- How did the group works support your learning?

The study module was also evaluated with the following questions rated from 0 to 5 (0=can’t say, 1=agree less, 5=agree most):

- Did your understanding of the taught substance increase?
- Was the working atmosphere encouraging?
- Did the education proceed logically?
- Did the materials enhance learning?

**Results:** Based on the feedback the new learning method enhanced learning well (mean 4.2, SD 0.5), and the group works supported learning (mean 4.0, SD 0.8). The study module was evaluated as followed:

- Understanding the substance: Mean: 4.0, SD*: 0.7
- Working atmosphere: Mean: 3.7, SD*: 0.9
- Logical proceeding: Mean: 2.1, SD*: 1.6
- Teaching materials: Mean: 2.9, SD*: 1.6

*Standard deviation

**Conclusions:** The feedback indicated that the new learning method with collating seminars promote learning better as compared to traditional final exams. The coherence of the study period should be developed further.
Title: Augmenting Students' Clinical Learning and Practice in Paediatric Dentistry using Chairside Simulation

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Aim: Paediatric dentistry is immensely rewarding but for undergraduates it may sometimes be unpredictable, challenging and stressful. Students need to be procedurally proficient and able to communicate effectively with very young and/or anxious children. Exploratory discussions with 4th year undergraduates (n=8) and observation of their clinical practice revealed that they were experiencing difficulties carrying out some paediatric treatments. The aim of this study was to investigate if simulation interventions carried out in the clinical environment might be effective in helping students overcome their difficulties.

Materials and Methods: An action research project involving five chairside simulation interventions was introduced during clinical sessions, covering infiltration and inferior dental block local anaesthetic administration, isolation, pulpotomy techniques and amalgam restorations. Qualitative data was derived from questionnaires and reflective accounts from students and teacher. Data mapping and analysis using the constant comparison method yielded a number of main themes related to students' learning and to clinical teaching.

Results: Students liked this type of clinical teaching. They found these interventions enhanced learning as they increased their clinical preparedness for pulpotomies and amalgam restorations and successfully addressed difficulties encountered with local anaesthesia and isolation. They reported improvements in their clinical skills, deepened understanding, increased confidence and some stress reduction.

Conclusions: While simulation is currently used in preclinical education, this study suggests that simulation may be beneficial if incorporated into clinical teaching sessions. The materials and models used in this study are easily accessible, no extra teaching space or time is required. Learning by simulation in the clinical environment would ensure immediate transfer of skills and learning. Early clinical learning may occur in this way, students may also engage in self-directed practise, further refining their clinical skills ensuring higher levels of proficiency.
Poster Title: The development of a safe, valuable and ethical overseas dental elective.

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Aim: Elective studies for undergraduate students have come under scrutiny in recent years with questioning of not only their safety and usefulness as a learning experience, but also their impact on the communities served. The aim of this project is to develop a valuable dental elective that consolidates student learning and skills in a safe but remote environment in a manner that also benefits the local population.

Materials and Methods: Dundee Dental School has close links with the Vine Trust’s Amazon Hope Medical Project (collaboration between a Scottish charity and Peruvian healthcare authorities) via a member of staff who is a member of the Trust’s Medical Committee and is on the Board of Directors. This has enabled the school to have direct links to the project and help ensure the development, validity and safety of an elective program in such a remote part of the world – on the Peruvian Amazon.

Results: The dental elective program commenced in 2007. By August 2016, 61 Dundee dental students will have taken part in the project. Students integrate into the ongoing work on the Amazon Hope medical boat, which has a fully equipped dental surgery. They undertake extractions, simple restorations, and preventative interventions. The provision of adequate supervision for the students has been paramount; this is normally achieved by recruiting UK dentists to partner the students in Peru. Personal feedback aided the development of the project and each student also has to submit a written report for assessment as coursework.

Conclusions: The Amazon Hope Medical Project provides a well-structured, relatively safe environment in which to practice and develop their clinical skills as well as allowing them to experience teamwork in challenging, stimulating circumstances.
Title: Teachers’ Approaches to Teaching Before and After Implementing the Constructive Alignment Model: One Year Follow Up Study

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Aim: The Constructive Alignment (CA) model (Biggs 1999) is being implemented at the University of the Andes Dental School as a process of teaching quality assurance. The model promotes that teaching-learning activities and assessment tasks must be “aligned” with the course intended learning outcomes in order to improve students’ learning.

This study aimed at assessing teachers’ approaches to teaching at the University of the Andes Dental School before and after implementing the CA model across the six-years programme.

Materials and Methods: Before implementing CA (March 2015), all 176 staff members were invited to anonymously complete the Approaches to Teaching Inventory (ATI) (Trigwell et al. 2005) to assess their approach to teaching (student-centred or teacher-centred). Subsequently, the Education Directorate delivered to all staff an introductory CA model seminar followed by 27 workshops on moving towards a competency-based curriculum; setting quantitative and qualitative learning outcomes, introducing active teaching techniques (think-pair-share, buzz groups, flipped classroom, pollev®, fishbowl, etc), designing and delivering valid (aligned with learning outcomes), fair and reliable assessment. One year after (March 2016), all staff were invited to complete the ATI once again. Before and after ATI results were statistically analysed.

Results: 114 (65%) and 116 (66%) teachers answered the ATI questionnaire before (2015) and after (2016) implementing CA, respectively. Before CA, 52% of teachers had a student-centred approach to teaching, 29% showed a teacher-centred approach, whilst 19% exhibited no dominance. One year later and after receiving training on CA, 67% of teachers presented a student-centred approach to teaching, 19% revealed a teacher-centred approach, and 14% showed no dominance. These differences were statistically significant (p≤ 0.002).

Conclusions: Training on Constructive Alignment as a model to set quantitative and qualitative learning outcomes, introduce active teaching techniques, and deliver valid, fair and reliable assessment, can produce a significant increase in staff adopting a student-centred approach to teaching.
Poster Presentation

**Title:** Bridging The Theory & Practice Gap in Dental Education - Learning By Doing

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**Aim:** While traditional pedagogies play an important role in dental undergraduate education, there is growing recognition of the need to foster students' ability to integrate their learning across contexts and time and develop the deeper attitudes and values needed to fulfill their future professional roles. This paper presents a novel educational intervention designed to scaffold student learning and develop students' ability to integrate and interpret knowledge and apply it in complex, real-life, unscripted situations.

**Materials and Methods:** This intervention is based around student participation in the Mouth Cancer Awareness Day events (MCAD 2010-2014). The role of the General Dental Practitioner (GDP) in Head & Neck Cancer (HNC) prevention and detection is a key topic in undergraduate dental education. Final year Bachelor of Dental Surgery and Dental Hygiene students were involved in providing HNC screening and risk reduction advice to the general public, using all the skills required in their future professional roles (CANMEDS). The intervention was scaffolded using the Teaching for Understanding (TfU) framework moving from the generative topic (GDP role in HNC prevention), to short and long-term understanding goals, providing opportunities for students to engage in performances of understanding with on-going formative assessment and opportunities for reflection. Students provided quantitative and qualitative feedback via anonymous self-completed questionnaires.

**Results:** Students deeply appreciated the opportunity to work in a real-life situation; they found the intervention challenging as it required them to integrate their 'book-learning' across contexts and time and apply it in a variety of new situations. The intervention highlighted gaps in their learning and understanding. Students also reported increased awareness of the complex, multifaceted nature of their future role as dental professionals.

**Conclusions:** Paper presents the benefits and challenges of this practical educational intervention designed to address curricular deficiencies associated with traditional approaches to dental undergraduate education, particularly the lack of 'practical real world relevance'.
Title: Second-year students’ perception of a removable prosthodontics preclinical course.

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Aim: The purpose of the study was to determine 1) students’ perception about the transmission of learning outcomes and evaluation criteria, and 2) the preferred teacher behavior, academic tools and feedback strategies which are most accepted by students during a preclinical course.

Materials and Methods: Subsequent to faculty members’ consent, a questionnaire was designed and administered to 51 subjects (15 males and 36 females) chosen randomly among the second year students. Five groups of subjects received the same preclinical demonstrations throughout the course with five different teachers. Diverse tools (visual, oral and written) and feedback strategies were adopted. After course delivery, subjects were asked to determine the effect they thought learning outcomes and evaluation criteria would give to their work, the adequate tools and when to use them, and the appropriate teacher behavior.

Results: Subjects preferred visual and oral tools (49%) to written ones (1.9%) throughout the course delivery. They preferred that a preclinical instructor would review the process of fabrication (54.9%) rather than give hints (21.6%) or only corrections (3.9%) afterwards. The preferred feedback was the one following a practical approach (72.5%) and showing at the same time a clear link with the related theories. Although they were unable to assess the outcome of their work (64.80%), subjects found learning outcomes to be well articulated (88.3%). Evaluation criteria were found useful by subjects for working at a quicker pace (96.10%), correcting their mistakes (90%) and decreasing amount of teacher intervention (76.4%).

Conclusions: Within the limitations of the study, it seems that visual and oral tools are more accepted by students, and preclinical instructors are highly encouraged to announce learning outcomes and evaluation criteria beforehand because they seem to increase learner autonomy (speed and correction) and decrease the frequency of teacher intervention.
Poster Presentation

Poster Title: Designing Teaching Methodologies according to the Learning Styles of First-Year Dentistry Students

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Aim: Teachers should implement strategies that foster learning in order to promote students' academic development. Nevertheless, students learn in different ways and not always as the teachers wish them to learn. As a means to identify how students learn, it is possible to assess and analyse their different learning styles (LS). Learning styles (LS) could be classified as: active (LSA), reflexive (LSR), theoretical (LST) and pragmatic (LSP). This study aims to design effective teaching methodologies for the “Skills development and self-care for professional practice” course by assessing the learning styles of the students

Materials and Methods: The sample for this study consisted of 119 students of the first year Dentistry course “Skills development and Self-care for Professional Practice I”. The students answered the CHAEA questionnaire, which was translated and adapted from LSQ (Learning style Questionnaire?) for academic contexts. The questionnaire presents 80 items that could be answered with (+) or (-). The questionnaire results served as a base for designing activities to enhance the learning environment in the course

Results: The means obtained in the questionnaire were: EAA: 11.29; EAR: 16.02; EAT: 14.17; EAP: 12.9. The analysis of the students’ learning profile showed that EAT and EAR were the predominant learning styles. As a results, learning methodologies were designed aiming for those that favour for student interaction, analytic observation (demonstrative videos for activities at the simulation clinical unit), application of logical contents (debates and experts panels), synthesis of information (preparation of essays and reading of focused articles), among others.

Conclusions: The post intervention evaluation showed that the methodology, evaluation style, resources and time management implemented were beneficial for the students in the course.
Poster Presentations:
Technology Enhanced Learning
Poster Presentation  Theme: Technology Enhanced Learning No 1

Poster Title: What future for dental simulators?

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Aim: Evaluate the opinions of students and instructors on the three currently available dental simulators for improving practical skills in operative dentistry.

Materials and Methods: 2nd- and 4th-year Degree students and 1st- and 2nd-year Masters students tested three simulators and then filled in an on-line survey about their experience.

Results: The preliminary results showed that the majority of participants considered that simulators are a good system for enhancing manual dexterity skills.

Conclusions: Students and instructors rated simulators positively as complementary training tools for learning the practical aspects of operative dentistry. Therefore, simulation training should be included in the curriculum.
Poster Presentation  
Theme: Technology Enhanced Learning No 2

Poster Title: The impact of Stereoacuity on dental performance in 2D and 3D viewing conditions using haptic dental simulator

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Aim: 
1- To measure the level of stereo-acuity among postgraduate dental students and explore its relation to their dental performance on Simodont.
2- Using virtual reality haptic dental simulator (Simodont), we explore how the students’ performance is affected by:
   a) Type of vision used during performance (3D and 2D vision).
   b) Task complexity represented by 2 viewing orientations (direct and indirect).

Materials and Methods: Sixteen postgraduate dental students at the School of dentistry, University of Leeds, participated in the study. Stereoacuity levels were measured using an automated Random Dot Test. Each participant performed a total of 4 different dental tasks under two conditions (2D and 3D vision) using special glasses, each with 2 levels of complexity (direct and indirect task) on a haptic virtual reality simulator (Simodont).

Results: Higher error scores and least task completion scores were associated with 2D vision performance. The stereoacuity levels of the participants were positively correlated with several performance parameters. We found a statistically significant interaction between stereoacuity levels and task performance under 2D and 3D viewing conditions (p < .001) particularly for the depth related performance error scores.

Conclusions: The performance of simulated tasks in haptic virtual reality dental simulator was optimized under 3d viewing condition. Stereoacuity levels of the participants were positively correlated to their performance, particularly with the depth related errors. All participants performed comparably across other performance metrics indicative of compensatory strategies and utilization of monocular cues to complete the tasks.
Title: Using A Smartphone App In The Workplace: Valuable For New Dentists And Doctors

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Aim: New graduate doctors and dentists can lack confidence when diagnosing/treating patients in their junior posts. We assessed how a smartphone ‘App’, with key medical texts, was used in the clinical workplace by postgraduate trainee dentists. We compared findings with our similar studies of newly-qualified doctors’ experience.

Materials and Methods: The Wales Deanery’s offer of the Dr.Companion© software (which provides a library of cross-searchable clinical textbooks) to trainee doctors (the “iDoc” app) was extended to trainee dentists (“iDent”) in 2015. After submitting a baseline questionnaire, participants downloaded the app onto their smartphone device. During the study they submit ‘case reports’ which detail specific instances of app use. Participants (30 trainee dentists) completed the baseline questionnaire and to date have submitted 18 case reports. Earlier studies with newly-qualified doctors (n=129) provide comparative data from 294 case reports.

Results: Like doctors, at baseline, dental trainees’ main information sources in the workplace were people-based: senior staff, peers and other staff in the dental team (70%, 57% and 35% consulted them daily). During the study, the most commonly consulted iDent books were the BNF, Oxford Handbook (OH) of Clinical Dentistry and OH of Emergency Medicine.

Mirroring our findings from iDoc case report data, by enabling immediate access to up-to-date and reliable information at-the-chairside, iDent enhanced the safety (e.g. checking dosage), timeliness (e.g. in relation to decision-making), effectiveness (e.g. evidence-based treatment planning) and efficiency (e.g. time saved searching for hard copy texts) of patient care. Doctors and dentists had concerns using a smartphone in front of patients (at iDent baseline, 67% anticipated feeling uncomfortable).

Conclusions: Our study with trainee dentists demonstrates how they benefit from the Dr.Companion© app in the same way as newly-qualified doctors. Providing internet-free/educational access to key textbooks, on their smartphone, supports trainees learning in the workplace and “saves clinical time” supporting patient safety (iDent case report #18).
Title: Impact of a learning support software to teach the diagnostic process of the pulpal and periapical diseases to dental students

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Aim: Teaching the diagnostic process and treatments of pulp and periapical disease constitutes one of the essential educational key in dentistry. The diagnostic process is an intellectual approach based on the understanding of both semiology and aetiology of a disease. This process leads to choice of treatment. Woda et al proposed to streamline the diagnosis of pulp and periapical disease, referring to the notion of diagnostic criteria.

Materials and Methods: An alpha version of a teaching software entitled PATHOPULP was developed in a web environment for computers or tablets. PATHOPULP offers the opportunity to learn the diagnostic criteria and the diagnostic processes of 14 pulpal and periapical diseases according to an iterative, on-demand method. In November 2014 seventy 4th-year students whom had received a formal theoretical teaching on pulpal semiology were evaluated on their ability to identify six pulpal statuses (healthy pulp, pulpal hyperaemia, acute apical periodontitis, acute apical abcess, sinus tract, irreversible pulpitis) with the use of a list of possible diagnostic criteria, before and after a 3 days on-demand training session with PATHOPULP software. Data analysis was conducted in order to assess the improvement of students between the two sessions.

Results: The initial knowledge of the students varied greatly depending on the pulpal disease: 40.7% for acute apical periodontitis; 48.1% for acute apical abcess; 54.8% for sinus tract; 76.5% for irreversible pulpitis; 77.2% for reversible pulpitis; 85.6% for healthy pulp. For each pulpal disease, the number of students being able to identify the disease after one or two attempts increased significantly: 84.5% for acute apical periodontitis; 86.8% for acute apical abcess; 77.9% for sinus tract; 86.5% for irreversible pulpitis; 95.7% for reversible pulpitis; 100% for healthy pulp.

Conclusions: The use of software reinforces students’ knowledge. It could be proposed for access throughout the initial cursus of the dental students, and for postgraduate courses.
Title: Comparison Between Two Successive Undergraduate BDS-Year 1 Students’ Improvement In Clinical Skills Through The Use Of The HapTel Virtual Dental Simulator.

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Aim: to measure and compare the learning enhancement of two successive BDS year-1 novice dental students’ cavity preparation skills using a haptic dental simulator to verify the consistency of the results across two consecutive years of hapTEL sessions.

Materials and Methods: The hapTEL work-stations which enable students to perform increasingly complex cavity preparations were used to teach 101 BDS-Year-1 dental students (January-February 2015) and 120 Year 1 (February-March 2016). All students, working in pairs, were taught during two 2/1.5-hour sessions to remove caries from simulated virtual teeth. Performances of: percentage of caries removed, healthy tissue remaining, exposure of the pulp; and the time taken were anonymously recorded by the systems for both sessions for 2 consecutive years (2015 & 2016)

The evaluation included: calculating the relationships (statistical correlations) between the above variables, to determine if (i) students achieve better results if they spend more time on the task; (ii) if they improve from the first to the second session; (iii) if the hapTEL virtual workstations help them to improve their clinical cavity preparation skills; and (iv) if the results could be consolidated and verified for a second year of similar learning experiences.

Results: 2015 results showed that the percentage of: caries tissue removed, healthy issue remaining and pulp exposure improved for over 90% of the students from Session 1 to Session 2. Results for 2016 showed similar gains in overall achievement scores thereby consolidating the results for the previous year in proving that students’ learning was consistently enhanced through the use of the hapTEL virtual dental work station.

Conclusions: The results collected over a two year period (2015 and 2016) support the earlier results that this hapTEL system improves hand-eye coordination, fine and gross motor skills and through formative assessment provided by the dynamic feedback, students’ performance of cavity preparation.
Title: Virtual Microscopy for the Teaching of Pathology in the Career of Odontology at the University of Talca

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Aim: Virtual microscopes have begun to be part of routine work in clinical laboratories and are of great help in teaching microscopy, constituting a very important tool in education, research and diagnosis. The University of Talca is incorporating the use of virtual microscopy (VM) in the teaching of pathology in order to improve the students teaching-learning process. This has generated an important collaborative work with the Faculty of Medicine of the University of Chile, whose aim is to generate an educational resource that allows students to learn better, optimize studying time and use optimal quality histopathologic slides.

General Aim: To implement the system of virtual microscopy for the teaching of pathology in the career of Odontology at the University of Talca.

Specific Aim: To evaluate the effectiveness of VM laboratories and compare them to conventional.

Materials and Methods: A total of 175 histopathological slides were digitized at the Center for Digital Pathology Assisted by Internet of the Faculty of Medicine. Five new tutorial guides were developed with syllabus methodology and were applied in three courses: a) Human Pathology b) Pathology and Oral Diagnosis and c) Integral Stomatlogy, involving 284 students from second to fourth year.

Results: The comparison of both methodologies clearly showed a better perception of the students regarding the activities of VM. This is in agreement with data reported in the literature, with greater acceptance in the higher coursers. Regarding the usability of VM and the on-screen viewer tool, student’s perception was largely positive.

The generation of new laboratory guides based on syllabus methodology established an educational resource well evaluated by the students.

Conclusions: The application of the VM is a novel method that maintains the standards of knowledge acquisition of the CM, stimulating a significant and autonomous learning in the students.
Funding: Teaching Innovation Projects 2015; CONICYT scholarship 21120391; FONDEF 11I1096.

**Poster Presentation**

**Theme:** Technology enhanced learning No 7

**Title:** Easy to use and the time required for a digital analysis system

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**Aim:** Digital analysis systems capture the preparation of the students with a measurement system and transfer the 3D data to an analysis software. The software evaluates the preparation in matters of the predetermined tolerance ranges on reduction, taper, quality of the surface and margin as well as undercuts. The analysis systems provide reproducible results and thereby an objective assessment compared to the conventional evaluation method by the faculty. Despite these advantages, the analysis systems are only established, if their handling is easy and not time-consuming.

**Materials and Methods:** To determine the required time 15 students worked with the analysis systems prepCheck Bluecam, prepCheck Omnicam and Romexis Compare. The time was measured for the working steps: Login to the system, digital impression of the preparation, mark the margin and run the analysis software. The students had no previous knowledge with the handling of the used systems. Respectively 5 students started the study with the same analysis system.

**Results:** From the digitization of the preparation to the start of the analysis software lasted an mean value of 2:57 minutes for prepCheck Bluecam. The median was 2:50 minutes. With the prep Check Omnicam an mean of 3:10 minutes and a median of 3:02 minutes was determined. When working with Romexis Compare the mean was 4:06 minutes and the median 4:11 minutes. The fastest trial was 1:50 minutes (prepCheck Bluecam), followed by prepCheck Omnicam with 2:01 minutes and Romexis Compare 2:44 minutes.

**Conclusions:** Digital analysis systems satisfy with reproducible and objective results. In order to benefit from these advantages, an operating time with a mean of about 3 minutes is acceptable. The systems are easy to use, so that the learning curve of the students reached the end already after 3 up to 4 trails.
Poster Presentation

Theme: Technology Enhanced Learning No 8

Poster Title: Educational programs and training using software application

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Aim: Given the dynamic existence on the labor market and accelerated changes taking place lately there is a growing emphasis on career planning and its management at both the individual and organizational level.

Materials and Methods: The aim of this study is to evaluate in congruency between individual career choice declared by dental faculty graduates promotions 2011-2015 and reality of the directions of employment finally obtained by these. There also is a major interest to assess by this approach the level that these graduates manifest for career counseling. We applied a questionnaire to 371 graduates in 2011-2015, and a total of 201 questionnaires to the same students after graduation, both questionnaires were interpreted statistically using SPSS 22 statistical analysis program.

Results: A large number of students have opted for opening private practice, 68% of the 371 wanted to. In the end nearly 40% succeeded but the majority from 2011 generation, and most in other cities than Iasi. Regarding loaning a practice, the situation is more balanced, the expectations were for 30.4% of graduates and materializing for 27.8% of them, the greater percentage is in this case for Iasi.

Conclusions: The two large studies showed discrepancies sometimes small and sometimes large between options graduates take and the reality of the labor market, highlighting not that students do not know to choose a career but rather that they lack the ability to select several options on which to track and finally to achieve.
Title: ICE Health Systems: The Next Generation of Electronic Health Records

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Aim: A collaboration of three US dental schools (Michigan, Pittsburgh and North Carolina), Internet2 (US) and ICE Health Systems (Canada) are working to create a cloud-based electronic health record (EHR) and data warehousing function first for dental schools and dental practitioners, and then extending it to all health specialties.

Materials and Methods: This innovative cloud-based EHR has five goals: (1) Enable collaboration among professionals using the service connecting clinicians to clinicians, clinicians to researcher, researcher to researchers. (2) Reduce costs by allowing users to do more with less. While committing to enhanced and consistent performance, cloud technology eliminates the need for servers and server support and significantly reduces software costs. (3) Provide convenient access to your EHR. Cloud technology means that you can access your account information directly and securely from any device with a browser. (4) Increase patient access. Patients can view their records at all times for emergencies or consultations with clinicians anywhere in the world. (5) Ensure security of systems and processes. Internet2, a partner of the GÉANT Project, works closely with ICE to ensure compliance with the Cloud Control Matrix security guidelines, thus ensuring a high level of system and process security. University of Michigan has also conducted an extensive audit of ICE's security posture.

Results: The result is an innovative collaboration between the cloud EHR service provider ICE Health Systems, the three dental schools, and Internet2. The modules that most frequently used during patient care will be demonstrated. They include: health history, charting, diagnosis and treatment planning.

Conclusions: This is the first time a service provider has agreed to work with dental schools to develop an EHR that focuses on supporting the patient care, education and research missions of academic dentistry with the long-term goal of improving patient outcomes first in oral health and then in all of health.
**Title:** PROSTHODONTICS 2.0 At ACTA Faculty

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**Aim:** In recent years two main developments have made a strong impact in the way restorative dentistry was being performed; the advance in bonding/new materials and the application and development of technology (hardware and software). The improvement of bonding and materials allows for more conservative treatments and a change from the classical indirect crowns based on retention principles to more conservative indirect bonded restorations. Technology offers numerous possibilities to enhance the way dentistry is performed, offers great tools for education, communication, diagnosis, planning and efficiency in the indirect restoration workflow. Technology is here to stay, and given the rapid development and expansion within our discipline, sufficient training is required for the students and staff to have the necessary knowledge and skills.

The aim of this project was to apply dental soft- and hardware in the fixed prosthodontics curriculum for (1) Diagnosis, (2) backward comprehensive planning, (3) Impressions, (4) indirect restoration design, (5) Smile design and virtual “wax up” (6) Educational tools (assessment).

**Materials and Methods:** The application of the Dental Design Software modules and the necessary hardware for the different practicum training in the fixed prosthodontics curriculum provides us with up to date tools to teach subjects such as (1) Diagnosis (2) Backward planning in bridge preparation training (3) Restoration design (4) 3D Digital smile design (5) Digital impressions. The ins and outs of Prosthodontics 2.0 will be explained in this presentation.

**Results:** Technology constitutes a very useful tool to enhance the education for dental students and will be available in many practices after students graduate. Hence training in the dental curriculum should be delivered accordingly.

**Conclusions:** This project is the first approach to upgrade the Fixed prosthodontics curriculum at the ACTA Faculty.
Poster Presentation  

Theme: Technology Enhanced Learning No 11

Poster Title: Virtual 3D Simulators in Preclinical Training for Dental Students in Riga Stradins University

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Aim: The aim of the study was to evaluate students` practical skills during the work with Dental 3D simulators and on typodont teeth.

Materials and Methods: The study involved 52 Dentistry 3rd semester students from Riga Stradins University. There were obtained and analysed automatic statistic from Simodont Moog serve and 2nd class cavities preparations test results and answers from questionnaire.

Results: For students a completion of all tasks on Simodont Moog took 44 hours. For one task student spent 1 hour and 24 minutes on average and it was done in four attempts. Most difficult was the 3rd level – eight attempts were necessary.

In practical tests on typodont teeth average mark was 6.3. Seven students (13%) did not pass practical test by first attempt but five students (10%) get an excellent mark.

Most of students claimed that “manual dexterity” tasks were not difficult and they partially improved their manual skills. Students considered that they had difficulties with 3rd level and indirect visibility manual dexterity tasks.

Conclusions: Simodont Moog virtual training allows students to perform the same task several times what develops their practical skills. Simodont Moog training increases students manual skills working on typodont teeth.
Poster Presentation  Theme: Technology Enhanced Learning No 12

Poster Title: Developing Patient-Specific Haptic Simulation for Undergraduate Prosthodontic Training

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Background: Traditional undergraduate prosthodontic training involves learning ideal tooth preparations for dental crowns. However, applying the principles of tooth preparation to a specific clinical case can prove challenging due to factors such as tooth angulation and the occlusion.

Aims:
To develop a method to allow students to practice a crown preparation for their patient, using haptic simulation.

To create a 3D rendering of the preparation, to inform discussion between the student and clinical tutor prior to the real clinical procedure.

Materials and Methods: Pre-operative dental study models were scanned in a 3D dental model scanner (Rexcan DS2, Europac, Crewe, UK). A 3-tooth section was manually selected comprising the tooth to be crowned and the adjacent teeth, using Meshlab software (http://meshlab.sourceforge.net/). Custom software was written to convert these data into a haptic ‘lesson’ which could be loaded into a virtual dental trainer (Simodont, MOOG, Nieuw-Vennep, Netherlands). Following haptic preparation of the tooth, a 3D PDF was created using a custom export tool and Simlab Composer (Simulation Lab Software, Amman, Jordan).

Results: The process of taking the digital models and creating the lesson took approximately five minutes. The haptic teeth simulated the feel of enamel and allowed unlimited practice attempts for the crown preparation. The 3D PDF was easy to email to the tutor and student, and allowed interactive 3D viewing of the preparation without the need for additional software.

Conclusions: Patient-specific practice of a crown preparation offers novice clinicians the opportunity to prepare for the real clinical procedure. This can be done in the safe environment of the haptic laboratory, without the need for tutor supervision. The 3D PDF offers a convenient way to visualise the planned preparation and facilitate discussion between the tutor and student prior to the real clinical procedure.
Poster Presentation  Theme: Technology enhanced learning No 13

Title: Developing a Massive Open On-line Course (MOOC) for dental implants education

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Aim: Implant dentistry is one of the most dynamic areas within oral health care. Despite its rapidly increasing impact, implant dentistry is scarcely taught in the undergraduate curricula and universities still have many difficulties to adequately implement it. To offer the necessary basic concepts of implant dentistry to the dental students and the general practitioners, as well as to help dentists provide flexible, comprehensive implant information to their patients, a quality-assured and unbiased open course in Implant Dentistry was developed.

Materials and Methods: The MOOC of implant dentistry was developed by the University of Hong Kong. Worldwide experts with solid backgrounds were invited to contribute to course. Professionals in educations and e-learning course development were convened to structure the program.

Results: The courses will be fully available on-line in both English and Chinese. Five modules are structured to cover the fundamental sciences and clinical application of implant dentistry. Each module consists of two parts: Part A includes mini-seminars by international experts on major theoretical concepts, current knowledge, evidence and best practices in implant dentistry. Part B presents the clinical applications corresponding to part A seminars. This includes demonstrations of instruments, devices and procedures, as well as discussion of clinical cases. Each of parts A and B complies about 60 minutes of video seminars, readings and assessment. The video lectures are kept to 3-5 minutes in length to capture the learners’ attention and keep them engaged. In addition, clearly listed learning objectives, and a short assessment in form of computer-graded multiple-choice questions after the video lesson can be found in each lecture.

Conclusions: An interactive educational program such as the one reported herein could benefit dental professionals and students internationally, and it should be a useful tool for enabling dentist to obtain the basic necessary understanding and skills related to implant therapy.
Title: Priorities in current European Educational Programs on simulation and computer-aided practice

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Aim: POSDRU programs implemented in Iasi in Romania offered the possibility to more than 10,000 students in the last 6 years to achieve knowledge and skills to a high standard of education and practice and to prepare them for the labor market.

Materials and Methods: Equipments purchased through these European projects constitute a single infrastructure in Dental medical education in our country, by the Centers of Excellence carrying out research and formative application, grafted on international requirements of a university and a medical dental practice, focused on technologies cutting edge of robotics and simulation within the 3D vision.

Results: The specific results of implementing the four European projects ensures the completion of a complex concept and completely innovative rehabilitation and integration of dentistry in the circuit of medical dental European project, through specific objectives promoted by equipment purchasing and by addressing a record number of students (10,065), as well as funds raised (13.7 million EUR) ensuring uniqueness of a university of excellence, with direct implications for training future practitioners and health status of Romanian patients.

Learning platforms in the medical field, individualized needs of students of the Faculty of Dental Medicine, in close correlation with the presence simulation systems 3D, unique in the country and existing only segmental in Europe and the practical arrangements for work on modern computerized devices such as laser equipment or CAD / CAM, materializes a real pole of competitiveness, with all directions of research and development, under the close complementarity.

Conclusions: You can not be efficient in a world evolving unless you find your insertion in full compliance with practical skills.
Poster Presentation    Theme: Technology Enhanced Learning No 15

Poster Title: Exploring the use of videos to explain case report viva examinations and marking criteria to third year dental students

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Aim: To explore student understanding of assessment and marking criteria arising from the use of videos showing simulated case report viva examinations

Materials and Methods: Videos using were produced to demonstrate case report viva examinations using mock cases, examiners and students. A range of “poor” to “very good” student responses were created for each situation along with examiner questions and prompts relevant to each response. Students were shown the videos as part of a 40 minute teaching session which explained the examination and marking criteria. Students were invited to submit their feedback using a paper questionnaire with a five point scale and prompts for qualitative comments. This was completed and submitted anonymously during a teaching session. Responses were collated and analysed using a thematic approach to data.

Results: A total of 48 students (64% of the year) responded to the questionnaire. The majority (95% n=46) found the videos useful. Students reported that videos helped with improving their: 1) understanding marking criteria, 2) awareness of student behaviour in the viva, 3) awareness of questions used in vivas 4), knowledge of approaches that can be used for answering questions. Students reported that videos helped them by 1) increasing their understanding of approaches for handling the viva 2) directing their preparation 3) putting them at their ease. In terms of improvements, students asked for more videos and more “good” response examples.

Conclusions: Students consider viva videos for case reports, with simulated realistic examples of questions and answers to be a useful tool for examination preparation. The use of video is deemed helpful for explaining examination processes and marking criteria to students. Further work is needed to examine whether these videos help to improve student performance in examinations.
Poster Presentation  

Theme: Technology Enhanced Learning No 16

Poster Title: What is the benefits and issues of shared lectures through video conference systems with oversea dental schools? - Results of the questionnaire to the students in “International Future Dentistry with the Outcome of Researches” (2014 and 2015) –

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Aim: Since 2014, we have established and shared the class “International Future Dentistry with the Outcome of Researches,” among three dental schools in different countries with video conference systems. The lectures in the class conducted in English about the trend of biology and genome medicine, and practice evidence-based and patient-oriented dentistry. We believe that sharing those lectures with other dental schools at the same time gives benefits to students to learn new topics and ideas. The aim of this study is to assess the benefits and issues of this new class.

Materials and Methods: We did a questionnaire survey to the students of three dental schools who attend the class in 2014 and 2015.

Results: The 338 of 4th and 5th graders (Indonesia; 162, Vietnam 123, Japan 53) responded to the questionnaire. 74.9 % of them answered “I could find some benefits for me”. The answer had positive correlations with the answer “I could learn new dental topics,” “I was stimulated by the attitude of foreign dental students” and “Even if I already knew some of the topics, I could learn the topics from different viewpoints”. On the other hands, many students commented that the schools should improve the internet condition for the class.

Conclusions: To share lectures among dental schools in different countries at the same moment is meaningful not only for receiving lectures from speakers in abroad but also for understanding different viewpoints. As issues, we need to develop appropriate internet conditions in each dental school to share live lectures more effectively.
**Poster Presentation**  
Theme: Technology Enhanced Learning No 17

**Title:** Exploratory study of a haptic virtual reality dental training simulator as an educational tool for dental students of the University of Chile

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**Aim:** Assess the impact of the use of a haptic three-dimensional virtual dental simulator in the psychomotor skills and level of satisfaction perceived by third-year students from the Faculty of Dentistry of the University of Chile 2015.

**Materials and Methods:** Thirty-two third-year students participated in this descriptive study through completion of psychomotor exercises available on the Simodont® Dental Trainer (MOOG) and pre and post- evaluation questionnaires. The studied variables (depth, contour, smooth and parallel walls) were measured in Learn-a-Prep II (Whip Mix) acrylic blocks in order to evaluate the performance before and after training in the haptic simulator.

**Results:** Both the control group (15 students) and the experimental group (17) showed no statistically significant differences between using the haptic simulator and acrylic blocks, in terms of psychomotor performance and working time employed. There was also no difference in the impact evaluation using either method. When consulting the students, they felt satisfied and considered that the simulator is a useful educational tool complementary to traditional pre-clinical teaching methodology.

**Conclusions:** The improvement of psychomotor skills of students who used an haptic simulator, was not different from those using acrylic blocks. Haptic 3D virtual reality dental training simulator was accepted by students as a useful complementary tool for pre-clinical training.
Aim: Although continuing education is common in dentistry, surveys of the outcomes of these learning environments are rare. In an explorative study, the outcomes of an extra-occupational, web-supported master’s program was analyzed, the MasterOnline Periodontology and Implant Therapy, seven years after its implementation.

Materials and Methods: Structured interviews (Witzel, 2015) on learning transfer and the factors that influence it were conducted with 6 course participants, 2 lecturers and 2 teletutors to more closely identify the transfer performance of the students as well as aids and barriers to learning transfer within this particular study programme. The interviews were evaluated analytically according to their content. A category scheme based on the Kirkpatrick’s (1994) four levels of training evaluation and Baldwin & Fords (1988) model of training transfer was applied to categorize interviewees’ comments on ‘learning transfer’ and its ‘influencing factors of the study programme’.

Results: The course participants interviewed mentioned both changes in superordinate processes such as the periodontal treatment concept as well as individual treatment steps.

Depending on the participants’ prior knowledge and experience, different results appear to be relevant for different participants: younger colleagues stress the greater confidence in their treatment concept and associated surgical techniques whereas experienced colleagues highlight the changes in practice procedures and new treatments that can be offered.

Conclusions: The structure of the study program as well as its key elements to foster knowledge transfer can also apply to continuing professional development in other areas of dentistry that involve surgical treatment approaches.
Poster Presentation    Theme: Technology Enhanced Learning No 19

Poster Title: Randomised controlled trial to compare eLearning with a nutrition training handout on the outcome of nutrition literacy amongst student dentists, hygienists and therapists

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Aim: The purpose of the study was to evaluate the effectiveness of an eLearning package compared with a standard educational nutrition handout in improving knowledge and understanding amongst undergraduate dental professionals.

Materials and Methods: The study was a parallel-group randomised controlled trial comparing an interventional eLearning package with a traditional “paper” PDF training handout. The study population was undergraduate dental, hygiene and therapy students in clinical training years at a single School of Dentistry. A paper questionnaire was used to measure baseline and post-intervention knowledge for both groups. A global rating of students’ experience was also measured in the post-intervention questionnaire. Analysis was conducted using SPSS.

Results: 126 students completed the baseline questionnaire and 60 students were included in post-study analyses (PDF: n = 31, eLearning: n = 29). There was no statistically significant difference in mean score changes between the PDF and eLearning groups, p = 0.373. No statistically significant difference was found in the global ratings between PDF and eLearning groups, p = 0.288. Moderate positive correlations were found between the time spent accessing the eLearning package and both the post-study questionnaire score, r(27) = 0.488, p = 0.007, and the global rating, r(27) = 0.390, p = 0.037.

Conclusions: Training via eLearning package did not enhance nutrition literacy when compared to a traditional PDF handout. Students who enjoyed the eLearning spent more time with the learning material and showed a greater increase in nutrition literacy scores. It is evident that some students enjoy delivery of content via eLearning and this can help learning, but this does not appear to apply to all students. The provision of a variety of learning opportunities may help students to develop nutrition literacy.
Poster Presentation | Theme: Technology Enhanced Learning No 20

**Poster Title:** Dental Diagnosis and Treatment plan using dental diagnosis simulation software and assessment sheet

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**Aim:** We have developed the original diagnosis simulation software program, which incorporates a practical method of thinking, to improve the students’ diagnostic competence and introduced in previous ADEE. In this study, we investigated the effect on searching the insufficient competence for new dentists using this software and an original scoring sheet.

**Materials and Methods:** The tests were performed for the residents who belong to Tohoku University hospital at May, 2015 and March, 2016. The participants selected some exploration items that they thought were necessary for a clinical site, then diagnosed using the collected information and drew up treatment plans for 50 mins. Meanwhile they filled the number of patients who participants have examined for a year and their treatment contents in a questionnaire. The prepared diagnosis and treatment plan were assessed according to an original scoring sheet and the score of March 2016 were compared to that of May 2015. The items of assessment were classified as following; ①Treatment for the chief complains, ②Taking systemic condition to account, ③Grasping problems, ④Treatment to eliminate the inflammation, ⑤Treatment to recover for mastication function and ⑥Treatment procedure.

**Results:** The higher sore were in the items of ①, ②, ⑤ and ⑥. These results were correspond to the treatment content for patients whom they have examined.

**Conclusions:** In general, the treatment plan were depended on the dentists because of their different background. Therefore we focused on whether they adequately extracted the problems and prepared treatment plan was based on their extracted problems in the competence evaluation. In this study, the combination with dental diagnosis simulation software and assessment sheet reveal successfully the sufficient point in a competence of participants. This work is supported by the grant for “Program for Promoting Inter-University Collaborative Education” from MEXT.
Aim: Tohoku University have performed the clinical simulation training course utilizing the systematical integrated training models possessing various morbidity, which enable the dental students to understand the treatment planning and the sequence of basic dental treatments. Based on responses from the questionnaire to the students and instructors, this training course was conducted by six departments in the school and their contents have been improved to put high clinical competence on students.

Materials and Methods: The training was performed by the fifty-one under graduate students who were belonging to Tohoku University Faculty of Dentistry for 2 months just before the clinical practice. The dental training jaw models (N16-N1.P.22, NISSIN Corporation, Kyoto) were provided to each student. The scenarios such as the movie for clinical interview and history, X-ray images, periodontal chart, etc., were fabricated for the clinical statement of these models. The tasks of this training were composed of diagnosis, treatment planning, and periodontal, operative, endodontic, surgical and prostodontic procedures. For the assessment, the original scoring criteria (rubric) and questionnaire were also prepared. The preparation tasks were newly added before the each training section in this time.

Results: The assessment using criteria of the score sheets were helpful in sharing the current understanding of the students. Furthermore the score for production in each training section with the preparation tasks were obviously higher than that of the training course without the preparation task, which was performed last year. The result of questionnaire was also supported to this result.

Conclusions: The preparation tasks induced higher score in the assessment for product in this the clinical simulation training course. This simulation training including preparation tasks is considered to be appropriate for the guidance of basic clinical treatments. This work is supported by the grant for “Program for Promoting Inter-University Collaborative Education” from MEXT.
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