The 42nd Annual ADEE Scientific Meeting

Science and the competent dentist an inter-professional perspective

Faculty of Dentistry - University of Barcelona
August 24th to 26th 2016
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Welcome to ADEE’s FREEStage

ADEE’s FREEStage concept is conceptualised as an informal and interactive short oral presentation followed by a questions and answer session to share (new) initiatives in education, sometimes still in the process of development, and discuss possibilities with colleagues and peers. It allows academics share their current education activities in a more relaxed and supportive environment. FREEStage has not been devised to provide a podium for standard oral presentation on known dental education topics, but rather to enhance the discussion over new ideas and evolving educational concepts.

Each selected participant is allowed up to 15 minutes (including questions and answers, presentation should be no more than 7 minutes in duration) to present their work and findings and to engage with the audience in an interactive manner.

I am honoured to chair these sessions on behalf of the ADEE Executive and Local Organising Committees. As chair I aim to encourage a facilitative, supportive and collaborative platform for discussion, with an ultimate aim to share your (best) practice, and plans or ideas for evolving education concepts with your peers.

This year for our meeting in Barcelona and drawing on the success and interest in the concept at our meeting in Szeged in 2015 we expanded the allocated time for FREEStage from two to three hours. This now provides us with an opportunity for 12 presentations and 5 dedicated FREEStage posters.

FREEStage is truly a concept that goes to the heart of the ADEE philosophy, the sharing of best practice in dental education, a European and international focus and a collegial atmosphere of peer support and the encouragement of the junior faculty to engage in practice that improves the quality of European dental education.

The following pages provide abstracts listed by title for the selected 12 FREEStage presentations and the 5 selected FREEStage posters, all of which are being presented on Thursday 25th August 2016. To those who were not selected this year, we encourage you to resubmit as your work evolves.

Dr Ronald Gorter
ADEE Executive Committee Member
Abstracts FreeStage Presentations
### Time slot allocations

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A knowledge management model used in dental preclinical practice considering metacognition and error as learning implemented in mobile applications

Main Contact: Prof Daniela Pino
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Aim: The study focused on:
- Study the incorporation of a Knowledge Management Model (KMM) into dental preclinical education that considered error and metacognition as learning.
- Student perception of the innovation using Information Communications Technologies (ICT).

Materials and Methods: The investigation was carried out at the School of Dentistry at Universidad de Concepción, Chile. With 12 third year students that had been taking the subject of “Dental Materials and Integrated Preclinical II” and working in fixed prostheses.

It was focus on action-research method, using qualitative techniques.

The KMM that we introduce included: access to information, representation, creation, transference and feedback. (https://drive.google.com/open?id=0BwJuArgwE8ZgMEJ4LjUdwWVhT0U)

Results: The access to the information was principally given by lectures and practical demonstrations, then our student made their own mental representation. Later, they must create a theoretical-practical representation. We gave them the possibility to transfer their experience and also another opportunity for feedback. To do that, we worked with mobiles by means of which our student took pictures of their work and wrote a reflection about their own practice in GoogleDrive.

In the student own words, they learnt in a more didactically way and valued metacognition and error as learning.

In the new virtual scenario we found metacognives dialogues and the recognition of the error as a source of learning.

Conclusions: This model broke the epistemological border that exists in a traditional learning process where our students live their own experience and do not transfer it.

The students valued the error and meta-cognition as part of their learning process. We changed the perception of the error as a thing that must be punished to a thing that could provide the possibility to build knowledge from it.

Finally, this study provides evidence for further research that involve the use of ICT to improve dental education under a model that guide our practices.
Assessing Competency Using e-Portfolios

Main Contact: Dr Denice CL Stewart  
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Aim: Develop and implement an e-portfolio system to assess student competency in six critical domains: treatment planning, evidence based dentistry, critical thinking, patient management, ability to self-assess and outcomes of care. The e-portfolio system must meet the educational expectations and security requirements of the school.

Materials and Methods: A team of faculty assessed commercial software and other platforms to select the best system for the school’s needs including customization, curricular requirements, importing of images, performance tracking, security, and overall ease of use. Faculty and administrators designed the system, which was pre-tested by students and faculty prior to training of all clinical students, faculty and staff. Competency assessment in the 6 domains relies on e-portfolio information and student-faculty mentor meetings to review, analyze and establish action plans.

Results: After evaluation of 3 e-portfolio systems, the decision was to utilize Box.com secure folders with school built templates to record clinical cases. Six students and select faculty pilot tested the box template system for ease of use, comprehensiveness, and applicability to curricular expectations. The implementation process included required committee approvals, training of 150 students and 15 faculty and staff before deployment in fall 2015. Each term all students meet with their faculty mentor for a formative assessment of one portfolio. The summative assessment is based on completion of 3 focused care portfolios and 5 comprehensive portfolios. A focus group is scheduled for spring term to evaluate the success of the e-portfolio system. Feedback thus far is overall positive.

Conclusions: An e-portfolio system is a good tool to track student progress toward and achievement of competency in six critical domains: treatment planning, evidence based dentistry, critical thinking, patient management, self-assessment, outcomes of care. Important considerations are the ease of use, security, and track performance over time.
Can standardised patients be used effectively to assess communication skills in final year dental assessments?

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**Affiliations:**  
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**Aim:** There is a limited body of evidence on the impact of using standardised patients in high-stakes final dental assessments, despite national commitment from DoH, NIHR and the GDC (Standards, 2013) on enhancing patient and public involvement (PPI) in assessment.

The aim of this study is to address this gap by evaluating if there is resonance between the assessment of communication skills by standardised patients with that of faculty, in a high-stakes Integrated Structured Clinical examination (ISCE), with a view to enhancing PPI in assessment.

**Materials and Methods:** There are three stations in the ISCE which use actors, as standardised patients, where the communication skills of dental students are assessed. Students are assessed against five criteria; listening skills, non-verbal communication, easily understandable verbal communication, professionalism and confidence and an overall judgement. Traditionally faculty only assess students but a pilot study was introduced where the standardised patients also assessed the students against these five criteria. Prior to assessment, faculty and standardised patients were benchmarked and calibrated to assess a minimally competent student.

62 students took the ISCE assessment and 20 standardised patients and faculty assessments were reviewed (n=20) for each of the actor elements.

**Results:** Standardised patients and faculty scored similarly for listening skills and non-verbal communication. There were differences in the scores for understandable communication and confidence and professionalism, with standardised patients scoring lower on average.

**Conclusions:** Standardised patients do not have prior knowledge of dental-specific terms and score lower for communication skills if “jargon” is used, in contrast to faculty who are used to hearing dental terms. Standardised patients prioritise professionalism and confidence as pre-requisites for good communication.

Standardised patients are appropriate to assess if dental students are fit for practice, and offer a unique insight into the assessment of dental students’ communication skills. This is a suitable way to enhance patient involvement in assessment.
Clinical Training in Virtual Reality: A new dimension in safety

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Aim: Simulation as preclinical training has been broadly used in Dentistry and other healthcare programs. Traditionally, mannequins with either plastic or the increasingly less available extracted teeth are used to train psychomotor and ergonomic skills. However, this approach restricts the opportunity to develop a more comprehensive training that includes i.e. decision making, problem solving and personal competence development. Also this simulation does not provide the students/trainees with the opportunity to repeatedly practice due to the costs involved, nor to learn at their own pace, being forced to face real clinical situations directly from preclinical settings.

The aim of this project was to develop a clinically based virtual reality training in which students, trainees and/or clinicians can practice real procedures before clinically performing them, in order to (1) verify treatment planning, (2) develop procedural skills, (3) improve confidence, and (4) increase the safety during clinical procedures.

Materials and Methods: Using STL files from an open intraoral scanner (3M™ True Definition Scanner), 3D haptic volumetric models were created and placed in the Simodont Dental Trainer, with a program developed by MOOG Inc. This pilot experience included patients from the restorative department of ACTA.

Results: Drillable virtual models of patients based on real clinical situations were made available for discussion and training: Real patients in Virtual Reality. This development can expand the limitations of traditional simulation in dentistry and opens huge opportunities in dental training: customized standardization of patients for education, full reality based simulation and simple clinical/academic interaction through the chance to export results into 3D interactive models or 3D printing. Increase of the resolution and including internal anatomy will improve the virtual experience.

Conclusions: Real patients in virtual reality enables an optimal preparation for handling a real clinical situation, enhancing skills, confidence and decision making, entering consequently into a new dimension in clinical safety.
Development and implementation of a progress test in undergraduate dental education – A prospective Austrian pilot project

Main Contact: Dr Barbara Kirnbauer
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Aim: Progress testing was developed during the 1970ies. Nowadays it is an established instrument in human medicine curricula throughout Europe and beyond. This useful tool is not, however, well established in dental education. A pub med search revealed only one result concerning a dental progress test, in the Peninsula schools of medicine and dentistry in Plymouth. A German-language dental progress test for the undergraduate dental curriculum at the Dental school of Medical University of Graz (Austria) was developed. First results are presented.

Materials and Methods: A pool of around 350 single best answer and K-type multiple-choice items at graduation-level from the specialist fields of Oral Surgery, Oral Medicine and Oral Radiology were compiled by a single author at the Division or Oral surgery and Orthodontics, Medical University of Graz. The author is a senior staff member with 10 years of experience in dental education. Special attention was paid to designing realistic case-vignettes and factual as well as practical knowledge at a higher cognitive level was targeted. Clinical pictures and radiographs were also included. Each question underwent a group and individual review by senior academics before final inclusion in the question pool.

Progress testing will start in June 2016 and will continue for at least two further terms. Participation is compulsory for all dental students in terms 7 to 12, with 72 persons at most taking part, as approved by the local advisory committee of dental study affairs.

For each test, around 80 items will be randomly selected based on a predesigned blueprint.

Results: First results and item statistics will be presented.

Conclusions: This is the first report of the introduction of a dental progress test in a German speaking country. Although labour intensive, it is thought to be a desirable assessment tool in dental education from which both students and educators can profit.
Diligence indicators to measure the performance of clinical dental students

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**Aim:** To investigate the use of diligence indicators as an appropriate marker to measure the performance of clinical dental students.

**Materials and Methods:** The Clinical Assessment and Feedback System (CAFS) developed at the University of Birmingham, UK records data related to the experience of clinical dentistry of undergraduate dental students. The data is processed into four categories for progress monitoring; Quantity, Range, Quality and Diligence. The data from three academic years of a cohort of students was analysed using Pearson’s correlation coefficient, comparing the data with a "Diligence Score" that was empirically calculated with an equal weighting to each indicator and is based on a student’s position within their cohort.

**Results:** If the components of "Diligence" are clearly defined and weighted, a "Diligence Score" could provide a good overall indicator of how well (or poorly) a student is progressing, compared to their own cohort (or previous cohorts). Five indicators correlated positively with the diligence score (>0.5) and two indicators had a stronger correlation (>0.8). Other positive correlations (>0.5) were found between indicators which would suggest that their worth in computing a diligence score is low, as the indicator correlates well with another. The use of poorly correlating indicators to compute the diligence score may better differentiate students by producing a larger range. Further work is ongoing to provide a specific weighting to each indicator to improve the effectiveness of the diligence score and correlate that with the teachers assessment of each student. This will also be presented at the ADEE meeting.

**Conclusions:** Identifying poorly performing students early is important to fostering a positive educational experience and improving clinical standards, ensuring the timely implementation of bespoke learning. The results from this study indicate that the diligence score proposed by CAFS may be used to monitor a student cohort and provide a holistic measure of their clinical performance.
Do Visual Representations Improve Students’ Performance in Anatomy Assessments?

Main Contact: Dr Barry Quinn  
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Affiliations:
¹Medical Education, University College London, Institute of Education and King’s College, London, London, United Kingdom  
Acknowledgements: Dr Arash Shahriari-Rad, Dr Barry Quinn, Professor Margaret Cox, King’s College London Dental Institute, Dr Richard Wingate, Professor Harold Ellis, King’s College London and Dr Charlie Owen, University College London, Institute of Education  
Aim: The aim of this study was to assess students’ knowledge of applied anatomy through clinically-oriented questions with presence or absence of visual resources (e.g. clinical findings and radiology images). Visual resources play an important role in improving the perceived quality of assessment in anatomy, however although advances in cognitive theory of multimedia learning has led to greater understanding of how we process textual and visual information during learning, the evidence base with regard to the use of various visual images within written assessments is still sparse.  
Materials and Methods: For this quasi-experimental design, ethical approval was obtained from six medical schools for collecting test data from second year medical students (n=174). The data was analysed through analysis of variance.  
Results: The results show that the presence of visual resources significantly improved students’ scores (p< .001 with medium effect size) as compared to the questions without visual resources. The image-questions referring to bones or soft-tissue made a statistically significant difference to their scores with high scores on bone-questions (p< .001 with a very large size effect).  
Conclusions: This study demonstrates that presence and absence of images and the deep structure of an image do impact students’ performance.  
Considering the criticality of anatomical and radiological images, and their importance in medical profession in investigating and examining patient’s anatomy, this study sets a way to understand the effects of visuals on commonly employed written assessments. Further research with respect to visual resources in assessments on cognitive processing and students’ views would enable the development of these written examinations. Dental undergraduate students also require understanding and knowledge about general and dental anatomy. Hence, there are plans to investigate similarities and/or differences in dental undergraduate at a similar level of competence to their medical colleagues.
Effectiveness of Blended Learning Suites in undergraduate dental education, Staff and students perceptions

Main Contact: Mrs Rosa Moreno Lopez
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Aim: To evaluate:
1. Students’ and staff views on video assisted teaching (VAT) at Aberdeen Dental School.
2. Whether videos of pre-clinical procedures uploaded on the University portal enhance students’ learning experience and practical skills, especially those students with Learning Disabilities.
3. The portability of these videos for life-long-learning (CPD courses) for Primary Care Practitioners.

Materials and Methods: Third year dental students will be required to make a preparation for a Resin Retained Bridge (RRB) using traditional methods of teaching. A week after having had access to a video on how to make the preparation they will carry out a further preparation. We will assess if there are any differences between the two of them by means of our usual assessment criteria for RRB preparations. It may be that any improvement in the student performance might be due to a Hawthorne effect. Therefore, we would also analyse the views of staff and students on the video using a self-administered questionnaire.

Although RRB preparations are not widely used nowadays, students are expected to have this skill. Therefore, this might be a skill that students will require to revise prior to doing the procedure to a patient. Similarly, we believe that students can use VAT on different clinical topics relating to MOS, operative dentistry, fixed and removable prosthodontics, periodontology and endodontics during self-directed study. This will facilitate improvement in the quality of their clinical skills.

Results: We will present the preliminary results for the ADEE conference.

These videos will be shared with Futudent as part of the scholarship granted to the University and we intend that in the future these will be disseminated into other Dental Schools to improve and homogenise the teaching within Europe.

Conclusions: This study will provide additional information on the effectiveness of videos in dental curriculums as well as provide homogeneity on students' teaching.
Moving beyond the ‘relevance’ debate: threshold concepts and reframing dental student perceptions of the Behavioural and Social Sciences- a discussion piece

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**Authors:** *Waylen A*, Neville P  
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1-2 School of Oral and Dental Sciences, University of Bristol, Bristol, United Kingdom

**Aim:** Research has found that many dental undergraduates struggle to see the relevance of behavioural and social sciences components to their training as dentists (Kent and Croucher 1992; Pine and McGoldrick 2000). Anecdotal evidence and students’ evaluation data collected over an eight year period by the speakers also confirms that dental undergraduate students find the behavioural and Social Sciences curriculum to be ‘different’ ‘boring’ and ‘irrelevant’ to their studies. This is despite evidence that this curriculum fosters skills in our students that are needed to understand and manage patient behaviours (McGoldrick, Pine and Mossey 1988) and improve patient adherence and outcomes. Ultimately our aim is to enable students to become more holistic and patient-centred practitioners (de Visser 2009, p.20). Cognisant of emerging educational research about threshold concepts and practices, both generally and in dentistry (e.g. Bowman 2016, Kitchin at al 2010, Kinchin et al 2011, Tsang 2010, 2011) we would like to present an alternative discourse about student (dis)engagement with the Behavioural and Social Sciences as ‘troublesome’ and ‘unsettling knowledge’.

**Materials and Methods:** Anecdotal evidence and students’ course evaluation data collected over an eight year period will be thematically analysed.

**Results:** This presentation will provide an overview of threshold concepts and their prominence in the student discourse on their experiences with the Behavioural and Social Sciences curriculum.

**Conclusions:** This presentation will provide an overview of threshold concepts and literature and a discussion on how this perspective could help re-frame our understanding of student’s experiences with the non-clinical aspect of their training, both for students as well as educators.
Smartphone based evaluation of dental lectures – a pilot study

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**Aim:** At the end of each semester the dental students are asked to evaluate anonymously all dental courses online. But only few students take part and the evaluation is no personal reflection for the lecturers. Therefore the feasibility and acceptance of a smartphone based evaluation was conducted and the influence on the perception of the students and the motivation of the lecturers were assessed.

**Materials and Methods:** In the summer semester 2015 eight lectures of the Department of Prosthodontics were evaluated voluntarily and anonymously using QR-codes, scanned by smartphones immediately at the end of the lessons. The linked questionnaire included 6 statements which could be rated by a numerous rating scale from 1 – 6 (excellent – bad). At the end of the semester the students (n=26) and the lecturers (n=4) were asked about their experience by a second questionnaire with the same rating scale.

Independently to this pilot study the regular evaluation by the Teaching Deanary was performed.

**Results:** In average 71% of the students (n=35) took part. No statement was rated worth than 2.1 in average. The ability of the lecturers to support the motivation for the topic was most diverse evaluated as well as the estimation of the students, that they understood the topic. The students felt coincidently, that the content was adequately presented, the lecturers were well prepared and in time and were able to explain the topic clearly.

The lecturers felt themselves fairly evaluated and more motivated to prepare themselves. The students preferred to take part in the smartphone based evaluation than the regular evaluation of the Teaching Deanary (answered by 8 students).

**Conclusions:** As almost all students use smartphones the immediate and individual evaluation of lessons may be a very easy possibility to motivate the students to listen more critically and the lecturers to prepare themselves for the lessons.
The Communal Consultation Video - enhancing learning and understanding

Main Contact: Assoc Prof Michael Botelho
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Authors: *Botelho MG

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Aim: Instructional videos are well established for psychomotor skills learning. However there are other skills and insights that can be gained from such on demand videos. Students often request one-on-one consultations for their patient’s clinical care. However, these rich, bespoke teaching and learning moments are usually lost to the rest of the class.

Materials and Methods: The author has video recorded treatment planning consultations for the learning community to benefit from. In addition, performances of summative clinical skills procedures have been similarly captured.

Results: These videos form part of a resource of over 100 videos for the fixed prosthodontics programme during the course in BDS 4 and in BDS 5 when students perform these treatments. The Communal Consultation Videos for treatment planning were intended to support students outside of the didactic psychomotor skill course and be useful for students to “bridge” the theory to clinical practice knowledge gap. These videos help support students transition to real world, authentic clinical cases relating to their own patients. The videos are catalogued by case complexity: straightforward, advanced, complex; tooth location and descriptive key words. This allows students to find the most relevant resources for their needs.

In addition the Communal Consultations Videos have been extended to cover clinical summative competency assessments of individual students focusing on the case presentation before and self-evaluation after the skills procedure. These have been captured with the desire of opening the black-box of assessment so “first-hand” exposure to the assessment process is afforded prior to the exam which defines features not only of scope but also quality.

Conclusions: Preliminary feedback for these resources has been well received and consumed. An analysis is being performed to determine the key features and benefits and how to increase consumption. These also act as an assessment resource for new staff moderation and calibration when competency testing.
Who Teaches the Teachers? An introductory programme for part time clinical teachers

**Main Contact:** Dr Sandra Zijlstra-Shaw  
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**Authors:** *Zijlstra-Shaw S*, Clarke JP, Jinks P, Stokes CW, Towers A, Jowett AK

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1-6 School of Clinical Dentistry, University of Sheffield, Sheffield, United Kingdom

**Aim:** Many Universities have programmes of educational practice already established for full time lecturers. These cover basic educational theory and allow subject specialists to become acquainted with current educational theory and practice. However these are often inaccessible to part-time clinical teachers, either because they involve time away from their routine general practice or because they are aimed at non-clinicians.

**Materials and Methods:** A team of experienced dental educators was assembled and a course was designed to introduce staff involved in teaching within the School of Clinical Dentistry, University of Sheffield to the theory and practice underpinning the undergraduate curriculum. It was designed to be accessible to part-time staff, being held fortnightly in the evening and supported by the School’s virtual learning environment. It was also designed to be a stepping stone to a Postgraduate Certificate in Medical Education. The course complied with Faculty learning and teaching strategy by providing opportunities for staff within the School to develop their teaching skills, by promoting excellence in learning and teaching and by providing continuing professional development opportunities in the skills needed to educate the students.

**Results:** The course was more than two and a half times oversubscribed. Attendance was good and the participants comments reflected the value they placed on the ability to share good educational practice. Reflective journals completed by the participants showed that their recognition of the importance of teaching increased, and their ability to give feedback and to recognise areas in which they needed to develop their teaching skills improved. Moreover these reflective journals could be the basis upon which participants could apply for Higher Education Academy recognition.

**Conclusions:** Initial findings suggest that a course specifically designed to meet the needs of part-time clinical teachers who are practice based is valued by participants and can be a useful addition to a faculty development programme.
Abstracts FreeStage Posters
An experience of the implementation of e-Learning in Dentistry

Main Contact: Prof Dr S Sanchez Gonzalez
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Aim: The aim of our work consists of developing e-Learning strategies to reach a functional education. Hence, instead of retaining data that may remain inert or forgotten, students must perform activities that allow them to use information to solve real situations. Students should then be able to use the acquired knowledge in their future profession.

Materials and Methods: The process of convergence to the European Higher Education, and teaching based on skills, requires methodological adaptations, including the use of activities that permit acquiring or constructing knowledge in a functional way. We have recorded a video, in which we explain the methodology used to achieve this objective in our subject, Pharmacology. In the first part we show how we teach our subject, this is, students’ work (individual and group). The second part includes interviews with students to know their opinion about the methodology used. Finally, we have also prepared a survey to collect general students’ opinion.

Results: Students highly valued the methodology we implemented. Both the individual (interviews) and general (survey) opinions showed a high degree of satisfaction. The results of the survey showed that 98 out of 100 students of Dentistry, in six of the seven items, outlined scores exceeding 2 (0 = strongly disagree, 3 = agree completely).

Conclusions: Our students highly value the methodology designed to achieve a functional teaching. The recorded video helps to understand how we try to achieve a functional teaching, how students work and finally their degree of satisfaction. We wish that the presented methodology will be useful to other teachers.
Development of a dental education innovation: collecting evidence “on the fly”

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Aim: To describe the approach of gathering evidence “on the fly”—namely, during implementation and development—of a new technical dental education innovation aiming to improve that innovation and determine its efficacy.

Materials and Methods: To illustrate the development and implementation of an innovative learning environment in dentistry, the authors described the process of designing and implementing the MOOG Simodont dental trainer using the “on the fly” approach. This dental trainer (DT) was developed for dental education by drawing on the assumptions and experiences from other learning environments and virtual learning environments.

Results: During implementation of the DT, the authors found that implementation and gathering evidence were essential but conflicting as the not yet existing evidence was crucial for acceptance and further development and use of the DT. In the long term, it appeared important to facilitate the converging of ideas and supporting implementation of the dental trainer in education. The described “on the fly” approach appeared a feasible concept to develop and introduce an innovation for dental education.

Conclusions: When pioneering an innovative technology in a specialty field, the development often precedes evidence for its effectiveness; nevertheless, gathering evidence using the “on the fly” approach provides valuable information for its further development and implementation.
Implementing an Objective Structured Clinical Examination (OSCE) for the assessment of clinical skills. A 6 years follow-up.

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Aim: The objective of this study was to investigate the effectiveness of implementing an OSCE for the assessment of clinical competences by measuring attitudes of both staff and students towards this new change in assessment methods.

Materials and Methods: 24 staff of ten departments in the Faculty of Dental Medicine at Université Saint-Joseph, Beirut, Lebanon had run an OSCE for 50 students (approximatively) over a period of 6 years. A questionnaire was answered by staff and students.

Results: Staff total attitude grew positively. Students' total attitude also grew positively but was lower than staff.

Conclusions: Six years later, the implementation of an OSCE appears to have been successful. Staff and students have accepted this new change in assessment methods.
**Students’ perceptions about Japanese-English dual linguistic education system at a dental school in Japan**

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**Aim:** We started the International Dental Course (IDC) program in 2011 in collaboration with Asian dental schools. IDC international students and 6-year regular dental program students have shared the curriculum for 3 years and half with subjects given by a Japanese - English dual linguistic education system in the same classroom. In this paper, we assess effects of the dual linguistic education system on the students’ perceptions.

**Materials and Methods:** We provided questionnaires to the students (at each end of the semester in 2012, 2013, 2014, 2015 and 2016) and lecturers (in 2013 and 2015) in the dental school to ask the impact of dual linguistic education.

**Results:** During 2nd year to 4th year program, more than 70% of responders finally understood the contents of class and the percentage of the students who were satisfied the class has continuously increased year by year. There is a positive correlation between the answer “I could understand contents in the class finally” and “I could understand lecturers’ explanations totally”/ “I had reviewed much for each class”. Lecturers in the dental school also prepared something for student to review the class. Additionally, almost all of the students answered they felt passion and effort of lecturers for their education. On the other hands, the understanding level and satisfaction level immediately down-shifted in the 5th year because of miscommunication and misunderstanding of lecturers in other faculties about the program.

**Conclusions:** Most of the students gradually adapt to the dual linguistic education system in five years. The programs with the dual linguistic education system have still continued.
Use of a preparation validating software (Dental Teacher® - KaVo) for pre-clinical teaching method enhancing learning procedure and performance

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**Aim:** To investigate the use of Dental Teacher® system for pre-clinical teaching method enhancing the learning procedure and performance of undergraduate dental students in cavity preparations.

**Materials and Methods:** Two groups, eighteen students in each group, were randomly chosen from fourth and fifth year dental students.

The task chosen for this study was to prepare an esthetic MO onlay cavity in tooth 16 in a plastic model. Cavity parameters were specified and standard burs were used for preparation.

For assessment, each tooth preparation was scanned with a digital scanner and analysed by using Dental Teacher® software.

In control group a second, corrective preparation was made by following supervisor instructions.

In test group the second preparation was made by following Dental Teacher analysis.

Final cavities were all scanned and assessed by Dental Teacher comparing the preparation similarity of their onlay cavity to the ideal preparation.

All data were recorded and analysed through the software including cavity depth and width in occlusal and proximal box, the extent of cusp reduction on mesiobuccal cusp and shoulder width around the mesiobuccal cusp.

Afterwards data was statistically evaluated by Wilcoxon Matched Pairs Test and Mann-Whitney U Test using Statistica 12 software (StatSoft Inc.)

**Results:** Results showed that improvement in test group preparations were statistically higher than those of the control group (p<0.05). In some values significant differences appeared.

**Conclusions:** The use of KaVo Dental Teacher helped students to learn preparation technic more efficiently for onlay restorations and seems to be a promising and useful method to facilitate their individual performance. Student feedback clearly showed the need for digital aid in education.