

KEYNOTE ADDRESS ABSTRACTS



Eeva Leinonen - “Technology Enhanced Learning: An Institutional Approach”
Vice Principal for Education, King’s College London

How does one begin to construct, articulate and implement a strategy for technology enhanced learning, or e-Learning, across a large multi-disciplinary university? What is the starting point and what are the necessary ingredients for success? I will tell a few stories about how I have led such a journey, twice in my career, in two very different types of university. Some strategies have worked well and some others less so, depending on many factors, including cultural dimensions relating to staff and working practices, institutional buy-in and leadership, and, predictably, availability of resources and how they are employed. Institutional journeys can be complex and challenging, and yet always interesting and inspiring.



Mark Woolford – “The New GDC Education Expectations and Implications for the UK and Europe”
Director of Education, King’s College London Dental Institute

The General Dental Council have been remarkably influential with regard to the education and training of dentists throughout Europe. Why? It is about to define a new set of learning outcomes for the whole dental workforce. How useful are these? What effect will they have with regard to

dental education in the United Kingdom, but also throughout Europe? What are the current and future challenges for dental education? Can/should countries in Europe stand alone or is the best way forward a collaborative approach? Is there a collaborative solution to some of the challenges to be faced? This presentation will be thought-provoking and almost certainly controversial, but it is essential a mechanism is found to allow discussion of these topics in a wide forum, ideally to find common solutions to some of the challenges to be faced in dental education. The presentation will not include all/any answers, but it is hoped that it will stimulate healthy debate.



Brian Millar – “Looking ahead: blended opportunities for Europe”
Director of Distance Learning, King’s College London

Blended Learning (BL) in dentistry has been pioneered at Kings for over 20 years and its ongoing evolution has led to it now being a core activity of our Institute with 258 currently studying Masters degrees. As well as online content and e-library facilities supported by face-to-face teaching we now include online tutorials, lecture capture and clinical mentoring. Our success can be measured in growth of both applications as well as accepted places of over 30% in each of the past few years. We are also experiencing demand to run new programmes such as Endodontics and Periodontics. The latter programme is proposed to run in two languages where students can obtain a joint degree from two EU partners which may open up further

opportunities within the EU to share and deliver content. We are also setting up programmes in non-dental fields through the broader King's College as the awareness of the popularity of blended learning to both students and teachers becomes more apparent. This development includes setting up pilot blended learning PhDs during 2011. Meanwhile we explore areas to pass our expertise to support the undergraduate BDS programme. Short courses, some of which have run here in Italy as part of this collaboration, offer the ability to market discrete units from Masters programmes as tasters for prospective students, as CPD courses as well as generate income for the providers. Having run our face-to-face courses in India for 5 years we are now offering these in Sydney to improve access. The presentation will cover these points for further discussion and to encourage further development through EU partnerships.



Dieter Schonwetter:
“From Barriers to Metaphors: Finding Solutions through Metaphors”
Director Educational Resources, Faculty Development and Dentistry Computing Services, University of Manitoba, Winnipeg, Canada

Facilitators: Dieter Schönwetter (University of Manitoba, Canada), Pat Reynolds (King's College London), Eva Dobozy (Edith Cowan University, Perth, by Skype)

Abstract: Adopting, implementing, and sustaining online learning programs is at best challenging for all those involved. As part of an interactive session, symposium facilitators will set the stage by first providing a short overview of the research data on online learning barriers collected at Brescia 2010 meeting, specifically as it results around adopting, implementing, and sustaining online learning for all stakeholders. Second, participants will receive a short overview of an innovative method of addressing these barriers through the introduction of metaphors. A few models of using metaphors will be presented and audience members will have the opportunity to provide immediate feedback on through polling tools. Audience input will assist in directing the final outcome of the presentation and the next steps of using metaphors to enhance

ce stakeholders adopting, implementing, and sustaining online learning.

HapTEL Symposium



Chair: Professor Margaret Cox OBE, King's College London

Acknowledgements: Thanks are due to the ESRC and EPSRC for funding the hapTEL project; and thanks to the extensive hapTEL team

for developing the system and the evaluation methods.

HapTEL to enhance learning: from design to dentist

Margaret J. Cox and Jonathan P. San Diego

The study to be presented in this symposium paper is part of the hapTEL project (see <http://www.haptel.kcl.ac.uk>), funded by the ESRC/EPSC's TEL Programme. The aims of hapTEL have been to design, develop and evaluate haptic and synthetic devices which would be used by a range of dental students and professionals to enhance the quality of their learning. The research reported in this symposium paper presents the complex nature of developing and evaluation haptics in dental education because of the need to take account of such variables as stages in the learning process, levels of immersion and the transfer between the virtual and real worlds.

This study is examining and using a mixed methodological research approach using quantitative and qualitative methods to measure the interactions and impacts between the technical, curriculum and evaluation strands of the hapTEL project (<http://www.haptel.kcl.ac.uk>). The aim is to build on Entwistle's educational evaluation model (1987) and the previous pedagogical framework (Webb and Cox, 2004).

Materials and Methods: A range of research methods and techniques are applied to assess the impact of Technology-Enhanced Learning (TEL), particularly the embedding of haptics into the dental undergraduate curriculum. These include: (i) a pre- and post-test large experimental and control groups quantitative study design, (ii) video-based observations and interviews of small group of learners, (iii) a pre and post opinion survey of students' and teachers' beliefs and attitudes towards traditional and virtual simulations; and (iv)

relating the above to interviews with a small group of selected students and dental tutors. The analysis of these mixed methodological results show that for the quantitative methods the statistical findings e.g. both training with haptics and training with the traditional technology can positively influence learning of clinical skills, whereas the qualitative methods using videos of students from both groups reveal the slight differences e.g. on handling dental instruments appropriately and other factors which will in turn impact upon the students' learning outcomes. The range of results from the hapTEL research show that for haptic TEL to make a positive contribution to students becoming competent dentists, institutional, curriculum and teaching practices all need to be considered to enable effective incorporation into the educational institution and to complement the traditional teaching practices.



The Place of HapTEL in the Undergraduate Dental Curriculum.

B. Quinn, M. Woolford, Jonathan P. San Diego

King's College London
The study to be presented in this symposium

paper is part of the hapTEL project (see <http://www.haptel.kcl.ac.uk>), funded by the ESRC/EPSRC's TEL Programme. The aims of hapTEL have been to design, develop and evaluate haptic and synthetic devices which would be used by a range of dental students and professionals to enhance the quality of their learning. The research reported in this symposium paper focuses on the different factors which need to be considered to enable the inclusion of technology enhanced learning (TEL) in the undergraduate dental curriculum.

The curriculum strand of the HapTEL project is investigating the approaches to teaching which are used before, during and following the introduction of the haptic environments, on the basis of observations and discussions with teaching staff. Furthermore, measurements of the teachers' attitudes and pedagogies (beliefs), the ways in which haptic technologies can be incorporated into a very structured curriculum, the ways in which the new technologies can be integrated into the whole undergraduate and postgraduate programmes show the affect of the uptake of new

technologies by the institute itself.

The results show that it is possible to incorporate TEL into undergraduate dental courses if clinical teachers can change their pedagogical practices without jeopardizing their course aims and objectives. Clinical teachers need to be engaged and open to accepting new technologies in their teaching within a blended approach. TEL needs to fit into the existing timetable and be located in an easily accessible location within the constraints of the existing Dental School and needs to be seen to benefit both the students and the university staff. Successful integration of TEL into the undergraduate curricula benefit from the following strategies: (i) Clinical, teaching and support staff need to be involved from the beginning of the introduction of the innovation; (ii) The courses need to have flexibility to accommodate change in both the traditional and TEL activities; (iii) TEL needs to be introduced early in the curriculum; (iv) Teachers need to be able to modify their pedagogical practice; (v) The potential benefit for students' learning needs to be communicated effectively to the student and staff communities.



A Proposed Behavioural Prediction Model For Measuring Students' Satisfaction With Dental Simulators

Tracy-ann Green, Jonathan P. San Diego, Margaret J. Cox, Patricia Reynolds, Barry

Quinn, Tim Newton and Mark Woolford
King's College London

The study to be presented in this symposium paper is part of the hapTEL project (see <http://www.haptel.kcl.ac.uk>), funded by the ESRC/ EPSRC's TEL Programme. The aims of hapTEL have been to design, develop and evaluate haptic and synthetic devices which would be used by a range of dental students and professionals to enhance the quality of their learning. The research reported in this symposium paper report on the development and testing of a model for empirically measuring student satisfaction with medical simulators that can be applied to all task- trainer simulators (e.g. plastic, virtual, high and low fidelity). This model can help predict how likely students are to carry out the behaviour of using such simulators.

Several models for measuring students' be-

haviour such as the Theory of Planned Behaviour (TpB), Technology Acceptance Model and general motivational models have been examined to develop a model which can be used specifically for simulators. A questionnaire containing fifteen constructs was then created using pre-existing scales from these models. The questionnaire was piloted to ten Year 2 dental undergraduates. After having established its validity and reliability, 132 Year 1 undergraduate dental students completed the questionnaire at the beginning of the term. The students then went on to attend their formal studies where they were trained using either the mannequin head simulator or the hapTEL virtual dental simulator. The questionnaire was re-administered after the autumn term (3 months) to test whether the model can predict different stages of student satisfaction, e.g. perceived level of satisfaction before using a particular simulator.

The data are still being analysed but individual constructs from the 15-item questionnaire showed acceptable levels of reliability and validity and the ability to predict the different stages of students' satisfaction with using the simulators. Although the proposed model is at its early stage, there is promising evidence showing that it can test student satisfaction with medical simulators and can be applied to all task-trainer simulators. The model will be further developed and validated using structural equation modelling.



Investigating Traditional and Formative and Summative Assessment and Technology Enhanced Learning (TEL) Methods for Measuring Students' Dental Clinical Skills

Arash Shahriari Rad,

Mark Woolford, Jonathan P. San Diego, Margaret J. Cox

The Dental Institute, King's College London
The study to be presented in this symposium is part of the hapTEL project (see <http://www.haptel.kcl.ac.uk>), funded by the ESRC/EPSRC's TEL Programme. The aims of hapTEL have been to design, develop and evaluate haptic and synthetic devices which would be used by a range of dental students

and professionals to enhance the quality of their learning. The research reported in this symposium focuses on the investigation into different traditional and TEL assessment techniques used to assess dental students' clinical skills and how psychometric tests also used within the hapTEL project and the assessment results compare with those used traditionally.

The traditional methods used by tutors for assessing the clinical skills of dental undergraduate students is by providing formative feedback in the clinical laboratory sessions for Years 1 and 2, followed by summative assessment of their performance at the end of their second year. The hapTEL project conducted a series of psychometric tests to measure the students' manual dexterity and spatial reasoning skills, which relate to the students' aptitudes and abilities to perform clinical procedures.

This research has two phases: Phase 1 involves 95 Year 3 students being assessed at the beginning of their first year (2008/09) for fine and gross motor skills using a range of psychological tests adopted by the hapTEL project. These results have been correlated with their clinical skills test results (part of the undergraduate course) assessed in March 2010. Phase 2 involves 144 Year 1 (2009/10) students, 48 of whom learnt clinical skills using the hapTEL workstations and 96 learnt traditionally.

The Phase 1 results to be presented in the symposium show that there is a significant correlation between the students' gross motor skills measured at the beginning of their 5 year degree programme and their clinical skills performance as assessed traditionally at the end of their second year after extensive teaching in the clinical skills laboratory. These results suggest that psychological tests might be able to predict students' clinical aptitudes. The Phase 2 results, which include measuring students' performance using the virtual system through logging all of their actions, show that students obtain immediate objective and accurate feedback using the hapTEL workstations compared with the spasmodic feedback provided by the tutors in the traditional laboratory. These and other more detailed results and their implications will be presented and discussed in the symposium.