

## COMMENTARY

### Put the Student in Charge: Take Part in the Biggest Revolution Ever in Teaching and Learning in Dermatology

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**Nearly all dermatology education will be possible online, with superior potential for interaction between student and teacher, for evidence-based learning and for meeting the needs of individual students. Online interaction is already integrated in dermatology undergraduate education in many universities. Teachers need to understand the new pedagogy and how to use novel e-learning techniques to unlock the fantastic potential of online dermatology education. But running the international Diploma in Practical Dermatology over the last 10 years has taught that provision of high quality online dermatology learning is labour intensive and not cheap.**

**Hard copy undergraduate books will be replaced by competitive online learning material aimed at medical students. Teaching universities will either rapidly adapt to a highly competitive world market in online courses, or sink. New educational institutions, specialising in online education, will soon become household names. New software will emerge, responsive to the individual student's learning needs, putting the student rather than the teacher in charge of life long learning.**

**Dermatology teachers are urged to: get educated about how to educate online, plan your undergraduate curriculum around identified learning objectives, find student-appropriate websites and apps, create new online videos, abandon live lectures, use tutor time for direct student interaction, set up online student interactive project work, and make your e-learning material freely available online to promote yourself and your department.**

“Stand back, the high speed e-learning train is approaching” Jump on fast!

In this issue of *Acta Dermato-Venereologica*, Rees (1) provides an excellent historical analysis of the interaction of dermatology teaching and technology advances and challenges us to think critically about all aspects of dermatology learning. But what about the next few years? After Gutenberg and Zuckerberg, how can you avoid hitting an Iceberg? First do not worry! The highest quality clinical dermatology education will always continue to require clinical exposure and experience, interaction with and feedback from inspiring teachers and high quality focussed knowledge acquisition. But second do worry, because nearly all of this can be experienced online. And online there is a vastly superior potential for enhanced interaction with other students and teachers, for evidence-

based and structured learning experience, for feedback, and for meeting the needs of individual students.

Admittedly my track record in predicting the future is not good. In 1986 I wrongly stated that the future potential of expert systems in dermatology diagnosis was immense (2) and in 1988 optimistically predicted that the demand for computer-based teaching programs would soon increase dramatically (3). Nonetheless, in Cardiff we have run an e-learning postgraduate dermatology diploma since 2002 and we abandoned live dermatology lectures to medical students in 2005, instead providing an online learning programme. Here are some reflections on this experience and speculations on the fantastic opportunities emerging to improve dermatology education.

#### AN E-LEARNING DIPLOMA

The Diploma in Practical Dermatology (DPD) was a distance learning course to teach GPs, based on old-fashioned regular postal communication (4). In 2002 we re-launched the DPD as an e-learning course (5), initially using a software platform created to our specification, but later moving to a commercial platform (Desire2Learn®). Students and teachers became able to communicate directly, contribute to on-going debates and become part of a living virtual community. The interactivity was transforming. Rees' “eccentric techno-utopianism of replacing campus-based teaching with distance learning from providers situated halfway across the world” became a reality when by 2005 the Cardiff Dermatology Department became the main provider of in-depth dermatology education to 400 GPs annually across the UK and Hong Kong, and in many other countries (6). An online Dermatology MSc (6) is now also offered by our team.

Provision of high quality e-learning is highly labour intensive. Universities may misguidedly imagine that this approach is a way to save money, as Rees warns, but they will soon find students shunning them. Over several years we set up a network of over 100 online tutors, many being the cream of the students from previous years. These tutors provide constant feedback, guidance and direction to the massive online activity and to the hundreds of on-going discussions, and they lead live virtual small group tutorials. The tutorials are

usually held on a Sunday morning (UK time) to allow for different work patterns and time zones: in one of my tutorials there were students from Australia, Hong Kong, Singapore, Canada and the UK. Case-based tutorials have become a fun and fascinating interactive global experience (7).

There are other reasons why providing quality e-learning is not cheap. We employ computer experts as learning technologists to solve frequent computer issues, provide technical support to students, lead website management and to develop new flexible teaching software.

## UNDERGRADUATE DERMATOLOGY E-LEARNING

Delivering an online course to motivated postgraduates made us aware of the obvious potential for medical student education. Live dermatology lectures were well attended compared to many other subjects, but not all students went to them. In 2005 we abandoned live dermatology lectures, replacing them with an online range of educational events that have high reported student satisfaction (8). Online there is no excuse for a student not to have watched a lecture, and it is straightforward to monitor which ones have been viewed by individual students. Teaching medical students online routinely encourages the creation of new approaches to learning, such as the use of the Virtual Patient to simulate the long-term follow-up of a patient with psoriasis (9). Monitoring student activity is simpler and more accurate in the online environment, yet it raises a host of practical and ethical issues.

We still of course assume an essential need for medical students to directly interact with patients. Students are likely to gain much more from clinical encounters if they already have good background knowledge: perhaps supervised clinical experience should only happen after an e-learning programme. Even watching dermatology surgery live on screen may be a more practical and effective learning experience than actually being in the theatre (10, 11).

Other universities in Graz (12), Liverpool (13), Berlin (14), San Francisco (15), Rome (16), Perth (17), Lleida (18) and Sao Paulo (19) have reported positive benefits from using e-based medical student dermatology teaching.

## NEED FOR EDUCATED TEACHERS

Effective e-learning needs a highly educated motivated and expert core team of dermatology teachers. We invested in our core teaching staff by encouraging and funding them to take a higher degree in Medical Education. This placed critical thinkers and innovators at the heart of our programme. As Rees stresses, successful

e-learning requires the combination of expert clinical knowledge, expert pedagogy understanding and expert teaching in a particular domain.

## E-LEARNING: A NEW PEDAGOGY, NEW TECHNIQUES

Nearly all aspects of online education are new and have to be understood and re-learned. In other words, do not just video your current lectures and stick them on your department's student Blackboard®.

Creating an online video is a separate new skill. Videos of live lectures available on line are in the main excruciatingly boring and probably seldom watched for long. Of course, notable exceptions exist, such as on TED.com. When recording a lecture for online use, you have to speak as if directly to one individual sitting beside you, not to a large group, a completely different technique. You must be short. We insisted that our lectures were a maximum of 10 min, a point critical to TED's effectiveness.

The 15 online lectures that we initially created covered specific learning objectives, matched to our own and to national standards. Student assessment was also based on the same objectives, providing an integrated and fair approach to the educational experience. It is possible in the online environment to ensure that this integration takes place, whereas in reality it is not practical to monitor or control live lecturers.

The real secret of making the online learning experience a success is having constant frequent interaction with other students and online tutors. Humans need to communicate. However, how do you encourage initially shy students to contribute to the online activities? We created a "Paddling Pool" area where less computer-savvy or more hesitant students could gain confidence. But the most effective carrot was to give an extra mark for activity online.

An unexpected advantage of the "typed" dermatology on line experience is that it is prejudice free, blind to race, gender and religion. However, when we make greater use of virtual classrooms with live video, some of these challenges may re-emerge.

## POTENTIAL FOR QUALITY CONTROL, RESEARCH, EVIDENCE-BASED LEARNING

The online environment, as it can be fully recorded and searched, provides a data base that allows the answering of research questions that would be impossible to address in a traditional educational setting (20–22). It should now be easier to develop evidence-based learning methods and programmes, rather than giving students what the teacher thinks best for them in the way that the teacher thinks best. The online environment also

allows vastly enhanced quality control of all aspects of the student's experience and generation of evidence of a student's capabilities and achievements. The need of employers for evidence of an individual's capabilities could potentially be met far more comprehensively than at present.

#### DERMATOLOGY EDUCATIONAL NEEDS: DIAGNOSTIC SKILLS

Despite faltering early attempts to model the dermatology diagnostic process using expert systems (23, 24) and a Bayesian approach (25), computer systems are now able to diagnose melanoma as accurately as humans under experimental conditions (26). Rees however provides fresh insight into the process of making dermatology diagnoses (1). This is obviously an essential prerequisite for being able to effectively teach diagnostic skills, and, with this understanding, online teaching should be able to provide much more effective and evidence-based training in diagnostic skills. Rees' group are making fascinating advances in the understanding of diagnostic processes, partly based on the application of non-analytic models of clinical reasoning, and are applying this knowledge creatively in new online concepts of learning (27).

#### FUTURE: DERMATOLOGY UNDERGRADUATE BOOKS

Printed dermatology undergraduate books have no long-term future. But there will be an even greater incentive to create them in an e-format, taking advantage of the greater ability to explain and demonstrate on line. Dermatologists will continue to write them, and make them available free, with the ego-boosting incentives of influencing the next generation and of trying to produce material that gains such a reputation that it is downloaded by hundreds of thousands of medical students worldwide. In the academic world such virtual popularity will carry its own academic reward. Publishers of dermatology journals, or academic dermatology departments will release 'chapters' on a regular basis to entice medical students to their websites. The vast amount of dermatology information available now on Wikipedia will continue to grow exponentially: its quality will also improve if you get in there and contribute.

#### FUTURE: EDUCATIONAL INSTITUTIONS

We have already reached a tipping point where there is a rapid and accelerating move worldwide to online education, often "blended" with live interactions. This will be a world market based on new financial models.

Today's universities are fundamentally based on the need to gather together teachers and learners in one place, but this can be ignored in planning an e-learning approach to education. Conservative attitudes and resistance to change in the higher education sector, coupled with the huge investment in university buildings for teaching, are not an encouraging background. Will current educational institutions be able to adapt fast enough to survive? Some universities may be too comfortable with their familiar 20<sup>th</sup> century educational model to begin to appreciate the long-term peril that they are in. Of course successful research-led universities will be less affected: the need to bring researchers physically together on the same campus is not under such immediate threat.

E-learning is already evolving within some current institutions. Harvard University and the Massachusetts Institute of Technology have committed US\$60 million to produce free online teaching (28). There are at least 16 dermatology programmes offered online (29). Universities (30, 31) and institutions (32) that have a vision, and are already investing in e-learning, are likely to prosper. Those who don't will eventually have to try to catch up or wither.

There may be a transition phase where universities simply become the accreditors of e-courses, outsourcing the creation of educational material and its delivery to others. Such outsourcing is already happening in traditional delivery courses. Or universities may take on the role of a "purchaser" of educational experiences from a vast choice of possible online providers. The packaging, delivery, standards, particular choice of provider, and most importantly the overall student experience of the online platform organised by the university would distinguish one university's course from another's on the same subject.

There is a massive opportunity for the creation of entirely new educational institutions, specialising in online delivery of education. Entirely new ventures, unencumbered by the red tape of traditional universities, are much more likely to succeed than grafting new branches onto old roots. Such e-universities will take over world markets in specific areas of education (including dermatology). The names of such as yet unborn e-universities will become household names, just as "Google" is now. One of the first is Udacity, set up in 2012 by Professor Sebastian Thrun, who left Stanford University after 23,000 students completed the free online course, mentioned by Rees, on artificial intelligence (28).

Continuing from Rees' point that the impact of the printing press allowed information to become available to all who could read, now the process of learning and being educated is being freed and made available to all. This is of immense significance for our rapidly expanding human race.

## FUTURE: EMPLOYERS

Vocation-based learning has special requirements. Employers of those who currently need vocation-based education (such as in medicine) will still need the reassurance that an individual has reached certain levels of education, knowledge, understanding, critical thinking and ability to take appropriate decisions. This might consist of a portfolio of evidence rather than following a single provider's course.

## FUTURE: THE INDIVIDUAL STUDENT'S LEARNING JOURNEY

At present the education framework meets the needs of those delivering education, who therefore have a strong motivation to maintain the status quo. Even today's first generation of software learning platforms, such as Blackboard®, try to recreate current methods of structured teacher-led education online.

The real excitement is in trying to create an entirely new world of education, starting with a blank screen and an entirely fresh mind-set. Imagine a software learning platform, let's call it StudentInCharge.com, where the individual student is in control and the student's needs are at the centre. The student is given assistance over defining their individual learning goals and then chooses from identified web-wide choices of suitable software programmes, learning aids and their various providers. Each of these might be free or have charges, may or may not carry some educational quality accreditation and on completion may earn educational credits. The student enters an online community of other students and is advised over which groups include like-minded students with similar motivations or interests. The student's needs are matched with suitable online tutors for direct live advice and supervision as directed by the student (not teacher). At intervals the student's needs and goals are reassessed and further informed choices taken for the next study areas. The hurdles of formal diplomas or degrees could become irrelevant as the student continues on their lifetime educational journey, a journey characterised by being student led and highly responsive to the student's particular needs. Education, defined as the process of "leading on" students, will at last give way to learning, the student-led exploration.

A student in this online environment would never need to visit a university building. Just as physical CD shops and bookshops are disappearing, physical lecture theatres in teaching universities may simply become irrelevant.

## CONCLUSION

The tectonic shifts mentioned by Rees in education technology will unleash a tsunami over current practi-

ces and institutions. Education is not going to stay the same; we are at the start of a radical revolution not only in delivery and availability, but also in the framework within which education occurs. Emerging from this ongoing chaos, there is the potential for massively enhancing the quality and the evidence basis of dermatology education. But if you are not yet guiding your students in their e-learning, wake up, they may not need you for long. (See Appendix SI for WHAT TO DO THIS WEEK; available from : <http://www.medicaljournals.se/acta/content/?doi=10.2340/00015555-1427>.)

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