

Medical E-learning: practical experiences in Turku

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Abstract

In this paper we summarize our experience about medical e-learning in Turku, Finland.

Technical infrastructure and support is important when the faculty organizes medical e-learning.

E-learning and teaching needs new educational skills and attitudes and the problems are often more psychological than technical. We describe our experience how medical e-learning is advantageous in national and international post-graduate training. In creation of European level medical e-learning the possibilities of close collaboration between the universities and the professional societies should be recognized.

Key words: e-learning, collaborative learning, web-conference.

Introduction

During 1990s Internet became in short time an everyday tool. It was natural to implement it also for teaching and learning. The belief in omnipotence of technology in teaching and learning was unshaken. But this boom was following the Gartner Hype Cycle: the peak of inflated expectations was approaching (Clegg et al., 2003). Many teachers asked the question: which is better – contact learning or e-learning (Shacher & Neumann, 2003)? It has been realized slowly that this black and white question is wrong. Both have their advantages and disadvantages (Ruiz et al., 2006).

Finnish experience with medical e-learning

The first e-learning implementations took place in 1997 in the faculty of Medicine in the University of Turku, Finland. After a few experiments and improvements it became clear that implementation of e-learning would require resource allocation. The teachers and also students should be provided by sufficient technical support (Juutinen, 2011) and an infrastructure of e-learning should be created in the faculty. The idea of a unit of medical e-learning was born. At first medical e-learning was launched in

support of two projects (MediNet 2003-6 and Telesphoros 2007-9) funded by the national Finnish Virtual University from the Ministry of Education. Since 2010 Finnish Virtual University has not granted special funding to the universities. Now medical e-learning in Turku has been possible with the support of the Finnish Higher Education Evaluation Council. This council designated the faculty of Medicine in Turku as a centre of excellence in Finnish university education in 2010-12 and e-learning activity was acknowledged. Nowadays the importance of e-learning activities has been realized throughout the faculty of medicine and – like it was originally meant to be – it has also turned out to be an established practice. We have one coordinator in medical e-learning and three system specialists in web-conferencing for 1153 graduate students and for 613 postgraduate students in our faculty. Here we summarize shortly our experience in e-learning locally, nationally and internationally.

Medica-portal and medical students

More than 10 years' time all the PowerPoint and other lecture presentations as well as other material in graduate studies have been stored in locally made

internet platform called “Medica”. The material was organised in folders according to all departments. Almost all the lectures of the entire curriculum are uploaded on Medica. Every group of students (approximately 120 students) has their own folder on Medica where the materials are uploaded. This system depends on mainly on activity of the students and teaching nurses who take care of uploading all the lectures to Medica. Students do not see e-learning as replacing traditional instructor-led training but as a complement to it (Ruiz et al., 2006). The folders are opened for the students during the different steps of the curriculum. In contrast to the students, the teachers see all the materials, also material from other clinics. Every student group names a student who is in charge of uploading and taking care of materials in Medica. Medical e-learning has sponsored netbooks and flash drives to facilitate the work of those students in charge of Medica. Also other study-related activities and interactions on Medica is allowed and encouraged. There are courses on how to use the university library, small writing courses and also examinations with patient photos in dermatology and ophthalmology. In the beginning there was a fear from the teachers’ side that this will decrease the presence of the students in the lectures. This turned out not to be the case, merely on the opposite happened and the activity has increased. Although online materials are found useful through the entire curriculum, their importance turned out to be vital during the period when the students are working in local hospitals outside the university hospital.

Already in the beginning of our work it became very clear that online learning and teaching takes much more than lectures and other materials uploaded in the web. An Internet technique in itself does not bring much extra value – it is the **human interaction** which lights the fire. But this means totally new attitudes among the students and teachers. It is important to give up the attitude that telling about matters and learning that is the same thing. The teacher is no longer the highest source of knowledge. The amount of information is so huge that the teacher is unable to cover everything. An awareness of one’s own actions and self in relation to others must be developed both in teachers and students. In this way e-learning also leads away from the authoritarian teaching model. After all, one of the most basic requirements for education in the future is to prepare learners for participation in a networked, information society. Computer-supported collaborative learning (CSCL) refers to instructional methods whereby students are encouraged or required to work together on learning tasks with the help of modern information and communication technology (Lehtinen et al., 1999).

Interactive web-courses

Medica-portal was developed in 2001 and soon after that the interactive web-courses were started. First laborious material was created in the internet for these courses. The students, however, were missing interactions and wanted to have more than just material for reading or clicking with the mouse. They wanted to have answers to their immediate questions. In those days a recipe for successful clinical web course was build. The answer was very simple: a reflective tutor brings a short history of the real clinical case and then challenges the students and asks their opinions. In the beginning the material should be limited. Day after day new information about the case is given. A good tutor inspires the students intellectually, brings fresh perspectives into to the subject being studied and guides the students to solve the real patient case. But it is not only problem solving. A good teacher follows the needs of the students. The case acts more as a source of inspiration and helps the teacher to make the student hungry for knowledge (Clark, 2002). In this way the course is intensive but also demanding. In our experience a good duration of the course is 1-2 weeks. During the course the teacher gives photos, X-rays and other clinical material in a proper time point. Timing is important, there should not be too much study material in the beginning. Links to papers in the e-library are given when the interest of the students has increased and not too early. The use of this technology-supported collaborative learning in dealing with complex authentic problems can make different beliefs visible. Knowledge elaborates gradually. As its most effective level it also highlights the necessity to understand other participants’ perspectives and to continuously reflect on one’s own previous knowledge and beliefs.

Training of teachers

A good teacher has to be an expert on the clinical field. The teachers should, however, realize that teaching with internet is different than contact teaching in small groups or lecturing. All the teachers have to have training for the methodology before they start on-line work. According to our experience the e-learning psychology is often more difficult than the technical questions. Before the web-course it is crucial to inform the students about learning objects and the style of the course. Timing is important and the teacher has to make a plan of his/her own activities during the course. The teacher should think what kind of material will be used. Usually there are plenty of sources available and one of the best is university e-library. Pub Med and Google Scholar are

commonly used. The new material will be offered during the course when the need comes evident during the interactive discussions. Usually the best starting material is a simple short and solid case history. The case “grows” day after day when the tutor gives more clinical information, photos and others. The teacher should not be too active because this usually decreases the student to student interaction. It is very important that the teacher “show up” online everyday so that the students notice that their comments will be followed. Some teachers make conclusions of the discussions after each day. In some courses the students are asked to make their own summary of the case, what they learned and what was missing. It is important that at least in the end of the course the teacher makes concluding remarks and gives additional reading (like links to journal papers) for the students.

Time and resources

All this means that web-courses take time and resources. The course teachers should realize to make space in their calendar for the whole time of the course. Usually the students work also in the evenings and the tutor might think to do so as well. Real time on-line e-learning is demanding and usually the internet courses are time independent. However, it is important that the students know about the time-schedules and the expectations. After every web-course students are able to give anonymous feedback via Webropol survey software which was implemented in the University of Turku in 2006. All the teachers should learn about the feedback and this should be discussed after each course.

Web courses for national purposes during specializations

We started to use Interactive web-courses also in training of different trainees in the whole Finland. Courses have been in pediatrics, obstetrics and gynecology, anesthesiology, otology, pulmonary diseases, radiology, surgery, internal medicine, neurology and others. These courses usually follow the same model as described above with the medical students. Each course usually includes 2-3 parallel real cases which will be discussed with the interactive problem-solving method in Medica- or Moodle-portal. Usually the number of trainees is 10-20 and the internet course takes 1-2 weeks. There are 2-3 tutors from the same or different cities. The teachers should agree about their work style and objectives of the course beforehand to avoid the teacher to teacher interaction in the course area. Instead they should encourage the learners to ask questions and give

comments (Lehtinen, 2010). The purpose is that the trainees also answer themselves. With this the teacher will realize the level of knowledge inside the student group. The teachers introduce links after carefully watching the needs of the students. This interactive method is very much based on the need of the trainees and the role of the teacher is more to act as a guide to the knowledge. Several times the case inspires the trainees to read journal papers and books outside the course material. The University of Turku gives diploma after each course to the active participants. Activity means at least one comment in three days during the week. A week of active online work is considered to be equal as one contact teaching day.

Here we give two examples of the national course activities. We have organized five national web-courses in gynecology. Most courses are case-based as described earlier. One course was about colposcopy with photos and pictures of different lesions. This course was done together with the Finnish Medical Society Duodecim. The Society has developed 28 web-courses about different topics in Medicine. There are 2 topics about gynecology: gynecologic laparoscopy and the other is prevention of gynecological cancer. These courses have modules of teaching materials including videos and the students go through the course material and also answer to the offered questions by clicking the right answers. There is no human interaction in these web-courses. With the collaborative effort we brought human interaction by organizing a new type of course for ten trainees in gynecology from different parts of the country. In this new type of course web-teachers helped the trainees go through the previously prepared colposcopy course material.

PediNet courses are national web courses for all the pediatric trainees in Finland, about 180 totally. The e-learning unit in the University of Turku organizes and co-ordinate the 1-2 week course twice a year. The starting date is informed to all the trainees and the courses are free of charge. Every department of Pediatrics in the five university hospital in Finland has its turn to provide tutors for these PediNet courses. The tutors do their teaching as a part of their work as university teachers. Usually 20-30 trainees participate. The courses are case-based problem-solving type and the course diploma will be given to the active participants, as described before.

Several courses have been organized in collaboration with different medical Societies in Finland and also in collaboration with the pharmaceutical industry. In the courses supported by the pharmaceutical industry no advertisements are allowed and the courses are strictly done by the medical professionals, not the industry.

International web-courses

Since 2003 we have organized international pediatric infectious disease teaching “ESPID Case Rounds” together with European Society for Paediatric Infectious Diseases (ESPID, www.espid.org). All this started with the close collaboration between the Educational Committee of ESPID and the Department of Pediatrics in Turku University. A pattern is similar as described with the case-based courses. First we used Medica and now Moodle as a platform. A coordinator of medical e-learning in Turku takes care of technical details, uploads materials online and gives guidance how to log into course area in Moodle. ESPID has nominated a clinical co-coordinator who organizes the tutors and makes annual list of cases and timing. Once a month, excluding 2 months in summer, there is a one week Case Round in Moodle. Tutors come all over the world. ESPID supports to cover the costs of the tutors and also Turku University for technical work. The Case Rounds are free of charge for the members of ESPID. At present there are more than 400 registered participants from 62 countries. A list of the Case Rounds in 2011 is shown in Table I. The Rounds are not anymore European but a global online discussion forum.

Case Rounds are based on real patient cases and under tutor’s guidance participants (trainees, pediatricians, pediatric infectious disease specialists) discuss about the case during 5 working days.

The case starts with a short history and then the story goes on day after day with new information.

The participants are active in giving additional study material, usually links to papers. During the end of the week the tutor will give “the right answer” and makes the concluding remarks.

Tr@inforPedHIV is an international course of paediatric HIV with e-learning and residential elements. It was created as a collaboration of Padova and Turku Universities, ESPID and PENTA in 2005. Penta is a pediatric HIV foundation (www.pentatrials.org). The course is designed for all healthcare professionals caring for children living with HIV, including training doctors, nurses, counsellors and psychologists (Fig. 1). Tr@inforPedHIV consists of a series of basic online modules about paediatric HIV. The modules have been created by the European paediatric HIV experts in PENTA. The initial part is a web based work in spring. The second part is activated after the summer when the course participants discuss online about 2-4 clinical cases, as described before. The tutors of these cases are mainly from UK and Spain. Turku takes care of the technical part. The third element of the course took place in the beginning in London but during the last

years it has been in Rome, usually in October. In this interactive residential symposium the students have brought their own cases and also hear lectures about the main topics in paediatric HIV. The faculty of this Tr@inforPedHIV is international and the economical support of ESPID made the whole idea to become a great European success. Along with the African colleagues, the faculty has developed an African specific Tr@inforPedHIV training course. This course was launched in 2007 in Cameroon, where the course was translated into French to reach a wider audience. Since, a course has been in Uganda and more recently in Harare, Zimbabwe and Lusaka, Zambia. In 2008, the course was translated into Spanish for a residential course in San Salvador and in January 2012 was held in Mexico City. Because of the limited resources the web-based courses have not been possible outside Europe but will happen in future.

In 2008 a new Postgraduate Diploma in Paediatric Infectious Diseases was started in Oxford University with the collaboration of ESPID and PENTA. The ESPID Case Rounds and the Tr@inforPedHIV became an important part of this diploma (www.conted.ox.ac.uk/pid). This is a part-time two year program which has on-line and residential elements. The students have on-line material including a textbook “Principles and Practice of Pediatric Infectious Diseases, (Long et al., 2008) and the on-line course runs for two terms each year covering the full syllabus with online tutor support of different topics and student discussion forums. The syllabus consists; infectious syndromes, therapeutics and infection control, epidemiology, immunity and immunization, bacterial Infections, important viral infections and prions, imported and tropical diseases and mycobacterial infection, congenital and neonatal infections, sexually transmitted diseases, parasitic diseases, the immuno-compromised host and fungal infection. The tutors are 29 experts of PID from several European countries. The students have to attend at least seven Case Rounds in a year and pass the Tr@inforPedHIV course. The residential part includes two Infection and Immunity in Children courses which run each summer in Oxford and the residential part of the Tr@inforPedHIV in Rome. The students also have to do summative elements like an audit or a case study with literature review, a dissertation of a specific area of PID and there is also an examination. The course fee is about 8000 pounds.

Web-conferencing

In Finland the number of medical students has increased in recent years and there is a need for

Table I. — ESPID Case Rounds in 2011.

415 registered participants from 67 countries	Total	Active	No. of comments
January; A 10 year old boy with fever and reduced exercise tolerance and weight loss Tutor: Dr. David Pace, Malta Final dg: Invasive pulmonary Aspergillosis	48	28	76
February; Wheezy coughing infant - its bronchiolitis of course! Tutor: Dr. Hermione Lyall, UK Final dg: Severe pertussis	58	26	57
March; An eleven year old boy with pharyngitis and cough Tutor: Dr. Fernanda Rodrigues, Portugal Final dg: Lemierre's syndrome	58	31	58
April; Chronic skin lesion Tutor: Dr. Gilat Livni, Israel Final dg: Cutaneous Leishmaniasis	58	38	94
May; Unusual rash in a young child Tutor: Prof. Vytautas Usonis, Lithuania Final dg: Kawasaki disease	60	32	79
September; Young boy with pneumonia Tutor: Prof. Jussi Mertsola, Finland Final dg: Listeria pneumonia and meningitis	66	34	104
October; A girl with back pain Tutor: Prof. Shai Ashkenazi, Israel Final dg: Vertebral osteomyelitis	64	30	111
November; A case of otitis media Tutor: Prof. Adam Finn, UK Final dg: Osteomyelitis of the petrous bone and meningitis	73	37	85
December; A girl with pneumonia Tutor: Prof. Chen-Hsun Chiu, Taiwan Final dg: Severe adenovirus pneumonia	59	33	61
Total = all the delegates who logged in during the case			
Active = all the delegates who posted comments during the case.			

expanding medical education in general hospitals outside the university hospital. The clinical education of medicine in the University of Turku has been decentralized mainly in two other cities, Pori and Vaasa. In this situation the students have to have a possibility to follow regular lectures even on distance. The University has, in close co-operation with the Hospital District of Southwest Finland, created a functional videoconferencing system. We have 45 equipments and Polycom and Codian web casting bridges. In 2011 we had 3400 multiple point conferences through the multipoint control unit which enables simultaneous videoconferencing among three or more remote points and there were even more point to point connections. The costs of investments have been remarkable, but the benefits of videoconferencing are undisputable. The videoconferencing system is used not only in medical graduate studies but also widely in postgraduate and continuing education. The web conferencing between different

cities is used also in direct patient meetings especially in cardiology and cardiac surgery. Video connections between surgical operation rooms and lecture halls have also been created.

After the initiation of Turku e-learning the medical faculties in the five universities in Finland have organized two national courses of Tropical Medicine with the web conferencing. The courses have been 2-3 hours in one day a week during the whole spring seasons in 2010-11. About 500 graduate and postgraduate students have participated in each course.

A few years ago Adobe Connect web conferencing software (AC) was introduced in the University of Turku. Since then it has been utilized as a conferencing tool for small meeting groups as well as a tool for webinars. AC is regularly in service in postgraduate training in occupational health care and in paediatrics. These departments use AC as a conference solution for regular seminars and meetings. In this way trainees from other hospitals do not necessary

PENTA - ESPID Course Tr@inforPedHIV 2011

Course Registration opens 1st March 2011, Online course opens 3rd May 2011Online course 2 starts 12th September 2011

Part 1 - 11 weekly online modules Part 2 - online interactive cases for discussion

Residential Course: Roma 24th - 26th October 2011

Online modules cover the following topics:

- Epidemiology, virology and immunology
- Mother to child transmission and prevention programmes
- The Immunology of paediatric HIV, and malignancy in paediatric HIV
- Antiretrovirals: Principle of ART treatment and strategies guidelines, toxicity and resistance
- Opportunistic infections, management and prevention (Hepatitis and TB co-infection)
- Nutrition and HIV
- Psychosocial aspects
- Sexual health in adolescents with HIV, and Post exposure Prophylaxis
- African-specific module

Registration fees:

Online & Residential Course: ESPID/CHIVA members: € 700

NON ESPID/CHIVA members: € 950

(Registration includes: individual password for online parts 1 and 2, participation in the three-day residential course (with meals), and a final CME certificate. Travel & accommodation not included.)

Online Course only: € 480

For further information please see: PENTA www.pentatrials.org or ESPID www.espid.orgOr contact: Sandra Settin sandras@pediatria.unipd.it or Christina Spencer-Drake csd@ctu.mrc.ac.uk

Delegates at the 2010 Tr@inforPedHIV course found it a very useful update and a practical approach to managing HIV in children. The course is for paediatricians, specialist nurses and pharmacists & others working with children with HIV.

The course is part of the Diploma in Paediatric Infectious Diseases from Oxford University, to find out more visit → <http://www.conted.ox.ac.uk/pid>

Fig. 1. — Tr@inforPedHIV is an international course of paediatric HIV with 2 courses of e-learning and residential course in Rome.

need to travel but they are able to view and comment lectures online from their own computers. Turku Centre for Biotechnology has taken a jump further: their lectures are not only one-way direction and in real time but lectures are also recorded and participants can watch recordings on their own computer at the time best suitable for them. In general there are different opinions about the recordings of the lectures. Some teachers do not accept the recordings. Some have doubts about copyrights which is an important question in the whole e-learning.

Summary

Technical infrastructure and support is important when the faculty organizes medical e-learning.

The demands most likely decrease with the arrival of new generations with better IT-skills. E-learning and teaching needs new educational skills and attitudes and the problems are often more psychological than technical. Medical e-learning is especially advantageous in national and international training efforts. Close collaboration and networking between the universities and the professional societies help in creation of new European training methods.

References

- Clark D. Psychological myths in e-learning. *Med teach.* 2002; 24:598-604.
- Clegg S, Hudson A, Steel J. The Emperor's New Clothes: globalization and e-learning in Higher Education. *Brit J Sociol Educ.* 2003;24:39-53.
- Juutinen S. Emotional obstacles of e-learning. Academic dissertation. Jyväskylä studies in computing 145. Jyväskylä University Printing House, 2011
- Lehtinen E, Hakkarainen K, Lipponen L et al. Computer Supported Collaborative Learning: A Review. CL-Net Project. 1999 Retrieved April 10, 2012, from the World Wide Web: <http://www.comlab.hut.fi/opetus/205/etatehtava1.pdf>
- Lehtinen E. The potential of teaching and learning supported by ICT for the acquisition of deep conceptual knowledge and the development of wisdom. In *From Information to Knowledge; from Knowledge to Wisdom: challenges and changes facing higher education in the digital age.* eds. De Corte E & Fenstad JE, Portland Press, London 2010, pp. 79-88.
- Long S, Pickering LK, Prober CG (eds). *Principles and Practice of Pediatric Infectious Diseases.* 3rd Edition. 2008. Churchill Livingstone.
- Ruiz JG, Mintzer MJ, Leipzig RM. The impact of e-learning in medical education. *Acad Med.* 2006;81:207-12.
- Shacher M, Neumann Y. Differences between traditional and distance education academic performances: A meta-analytical approach. *International Review of Research in Open and Distance Learning.* 2003;4.