## T1

**The state of the art**

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## T2

**The teaching of physiology in Spanish medical schools**

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World Federation for Medical Education standards in Basic Medical Education (2000) and other documents (Schwarz & Wojtcak, 2002) by experts in medical education have established that physiology and other basic biomedical sciences must provide the scientific knowledge and methods to apply to clinical sciences and should be adapted to scientific, technological and clinical developments as well as to the health needs of society. To accomplish this objective it is necessary that medical schools define specific outcomes of the undergraduate period as a step prior to identifying the contribution of physiology and the other sciences to the whole curriculum. Moreover, because physiology and other basic sciences are more used in the clinical period than is apparent, other recommendations in order to ensure a best perception of the relevance of physiology by students are: (a) physiology and other biomedical basics should be taught in an integrated form in the medical curriculum with clinical sciences, including both horizontal (concurrent) and vertical (sequential) integration, (b) problem-based learning methodology and some elemental clinical aspects should be incorporate as soon as possible, and (c) both scientists and clinicians must be engaged in specific teaching topics. In this presentation we analyse the situation of physiology teaching in Spanish medical schools in the context of the new curricula, taking into account the above recommendations. Other aspects as the number of hours devoted to physiology, the number of teachers and students engaged in teaching physiology, learning activities and assessment tools used are discussed.

Schwarz MR & Wojtcak A (2002). *Medical Teacher* **24**, 125–129.

World Federation for Medical Education Task Force (2000). *Medical Education* **34**, 665–675.

## T3

**The use of computers, the Web and information technology in the teaching of physiology**

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## T4

**New technologies and integration of medical knowledge**

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## T5

**The replacement of animals in university teaching: the activities of the European Resource Centre for Alternatives (EURCA)**

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The use of animals in teaching in higher education has become increasingly controversial and perhaps it is time to consider replacing traditional animal labs with different alternative methods.

In Article 25 of the European Convention for the Protection of Vertebrate Animals used for Experimental and other Scientific Purposes, the Council of Europe states that 'procedures carried out for the purpose of education, training or further training of professionals shall be restricted to those absolutely necessary for the purpose of the education or training concerned and shall be permitted only if their objective cannot be achieved by comparably effective audiovisual or any other suitable method.'

Teachers have an important role to play in defining the teaching and learning objectives of classes which use animals. Computer-based simulations of many animal labs are now widely available, which may meet many of the learning objectives. Nevertheless, the quality of these programs varies considerably and it is important for teachers to be provided with as much information about them as possible if they are to be persuaded to use them.

One project which may assis in this process is the European Resource Centre for Alternatives to using animals in higher education (EURCA) The idea first arose in 1998, during a workshop on 'Alternatives to the use of animals in higher education sponsored by 'ECVAM' (The European Centre for the Validation of Alternatives in Medicine).

EURCA actively promotes the use of alternatives to using animals in higher education, and provides a mechanism for effective dissemination of useful information about alternatives. These objectives are achieved by establishing a Resource Centre – a collection of electronic alternatives – and taking this to relevant scientific meetings in Europe where it would function as a drop-in advice centre for teachers; developing a website (http://www.eurca.org) with an information-rich (product information, independent (commissioned) reviews, users comments, links to evaluative studies) database of alternatives, creating a network of academic teachers who actively use alternatives to take responsability for disseminating information about alternatives to other teachers in the European community.

### T6

**Reusable learning objects – a Lego™ approach to teaching medicine?**

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A reusable learning object (RLO) has been defined as 'any digital resource that can be reused to support learning' (Wiley, 2000). As such, digital learning objects can be considered to be the Lego™ bricks of a teaching session delivered via, for example Microsoft PowerPoint or a VLE. They may include learning/information objects such as text, digital images, photographs, video or audio clips, animation sequences, question–answer activities, case scenarios, web pages and simulations. Since many of these objects already exist in digital archives, the concept of reusability – i.e. the opportunity to save time and money by sharing these resources between institutions, between courses, e.g. medicine and nursing, and between course levels, e.g. undergraduate and postgraduate – becomes very attractive. To enable this to happen these Lego -like components must be collected into digital repositories, catalogued and described by adding appropriate metadata so that they can be readily identified, made available for easy downloading and then assembled by the teacher to meet local needs a process analogous to the same set of Lego bricks being used to build a house or a car. However, making it easy to access learning objects is only the first step. To transform a collection of RLOs into a learning activity such as a lecture or an e-learning course requires particular instructional design skills. The process a teacher employs to assemble the RLOs into a learning activity may be similar to the step-wise Lego guide for building an assembly of different sized and shaped bricks into a specific model. In the educational context teachers could either use an exemplar of a learning activity constructed from a defined set of RLOs if the outcomes of the activity met with their own or they could assemble different components to produce a new learning activity which met their needs. The final stage concerns embedding the learning activity into a course. One strategy to facilitate this process is to help teachers to develop 'wrap-around' materials which provide the context, assessment and give 'ownership' of the materials to the teacher.

This presentation will focus on a UK Government-funded (Joint Information Systems Committee (JISC) Exchange for Learning Programme (X4L)) project (ACETS at www.acets.ac.uk). The project is led by the University of Edinburgh but involves a number of other UK HE and FE institutions and aims to investigate and evaluate how RLOs can be successfully implemented in the support of medical and healthcare professional education. The initial stages of the project will focus on the implementation of a selection of RLOs from anatomy and communication skills and will involve: creating a central repository with internet access (A = ASSEMBLE); developing methods of cataloguing and adding descriptive metadata (including learning object descriptors (type of object, author(s), year etc, MESH-compliant descriptors, pedagogical descriptors, IPR descriptors)) to the RLOs, and ensuring that they meet international interoperability standards to facilitate their ready availability to users and systems in many different situations (C= CATALOGUE). Teams of experienced teachers will be commissioned to develop 'wrap-arounds' for selected RLOs and so assemble a learning activity/course to meet their local needs. The building process will be monitored and the resulting RLO assembly/learning activity will be used as an exemplar (E=EXEMPLIFY). The development processes and the impact on student learning will be evaluated (T=TEST). The final stage will be dissemination of the project outcomes (S=SHARE).

Wiley, D. A. (2000). Connecting learning objects to instructional design theory: A definition, a metaphor, and a taxonomy. In *The Instructional Use of Learning Objects*, ed. Wiley, DA. The Association for Instructional Technology and the Association for Educational Communications and Technology. Online Version: http://reusability.org/read/chapters/wiley.doc