

# Anatomical teaching for medical students from the perspective of European Union enlargement

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**A.R.M. Chirculescu<sup>1,2,\*</sup>, M. Chirculescu<sup>1</sup> and J.F. Morris<sup>2</sup>**

*1- Dept. of Anatomy, Faculty of Medicine, C. Davila University, Bucharest*

*2- Dept. of Physiology, Anatomy & Genetics, University of Oxford, U.K.*

*\* Senior Visiting Fellow of the Anatomical Society of Great Britain and Ireland*

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Some problems of anatomical education for medical students are briefly discussed here, concerning teaching, learning and evaluation of students' knowledge, from the perspective of the new trends and requirements imposed by EU enlargement and based on 12 years of Tempus and Erasmus cooperation.

The European Union has developed an ongoing series of programs (Tempus, Erasmus, Socrates), during the last 15 years, in order to assist teaching activities in universities of the countries of eastern Europe. Their purpose, for successful applicants, is to improve academic standards and to create minimum levels of compatibility of educational standards between different national educational systems, including medical schools, between current member states of the EU and potential candidates for membership, following the political changes in the region since 1989. These programs were also intended to develop close and sustained links between teaching staff from western and eastern European countries, in order to align the educational programs to the requirements and trends of the western democracies and to help overcome unwanted influences carried over from past political regimes. Another purpose of these programs was to create a network of short term reciprocal exchanges. These projects

involved both students (undergraduate and PhD) and teaching staff (Faculty) at different levels (both lecturers and demonstrators early in their career such as instructors, prosectors). The EU programs in which we, in Bucharest, were involved were intended also to develop and improve our curricula (including in anatomy, embryology and neurosciences).

Joining the European Union is not only a political, social and economic act, but it also presupposes a series of adaptive actions in the academic domain. Once the political decision to extend the European Union was taken, one of the key targets was education, with one aim being to establish a common basis for a valid and equitable European Credit Transfer System (ECTS), that would be generally accepted and reciprocally recognized, in all European countries. This, in turn, raised questions of defining core curricula or benchmarks, modular organization of courses, methods of teaching and assessment, student-directed learning, problem-based learning (PBL) and personal development planning (PDP). The design of more or less equivalent curricula in different countries should allow free transfer from between universities without restriction. This may be contrasted with the situation in Bucharest, at the present time, when any such transfers raise the problem of constructing

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Correspondence to:  
Assoc. Prof. A.R.M. Chirculescu, Department of Anatomy, C. Davila University,  
14, Dr. Severeanu st., 050675 Bucharest, Romania.  
E-mail:andy\_chirculescu@yahoo.com

individual curricula and assessments for each transferring student, depending on the university from which (s)he comes.

There have been many different views and opinions expressed concerning all aspects of medical education, including anatomy, which need to be analyzed and solved. The ideas and comments presented here are the result of 12 years Tempus and Erasmus cooperation.

Anatomy is still considered a crucial part of medical education in most medical schools, despite the very evident trends to reduce or minimize the time devoted to it (Chirculescu and Morris, 2007). It is evident that this view of its crucial role is shared by lay persons, medical students, professional anatomists and trainee surgeons studying anatomy (Moxham, 2005, 2006). Discussion with participants in the principles of clinical anatomy course in Oxford (Morris and Chirculescu, 2006) have provided similar evidence confirming this view. The students' attitude toward anatomy, the dissection room, and teaching staff (Shah, 2006) is strikingly similar in UK and in Bucharest. However, the most important question remains, "How is the anatomy that any school expects its students to learn defined?" Some possible answers are: (a) as specific objectives given to the students; (b) as general goals from which students must produce specific objectives; (c) by a core curriculum and optional additional material; or (d) as much as possible. For successful integration across the EU, the solutions arrived at by different medical schools within the EU need to be broadly similar.

A particularly important aspect is to define the teaching aims of anatomy courses. Some of the key aims that can be defined are to; provide a background for other basic sciences and for clinical disciplines (including, but not confined to surgery), to relate normal structure to function and to pathology and to develop and train manual skills, etc. Further aims that can be defined are; to ensure uniform grading and equal opportunities for all groups of students, based on core information and additional material, used in logical ways to arrive at diagnoses, treatments, and management plans. Much attention has to be paid to the grouping of topic subjects, when designing a new course, to avoid overlap between courses or the omission of relevant aspects, and to ensure that each main aspect is fully covered with that information which is relevant.

In the absence of hard data on the effectiveness of different teaching methods, it is important to maintain a rational balance between different methods: dissection by students, prosection and demonstrations, didactic lectures, use of models (including plastinated material), computer-aided and computer-assisted learning (CAL), radiological, CT, MR, ultrasound and living/surface anatomy. PBL based on common clinical conditions, virtual anatomy, virtual dissection, are now generally considered useful complementary learning methods. Lectures, demonstrations, practical sessions, seminars, small groups, personal and academic tutorials, as well as the use of computerized teaching programs and specific project-based tasks ("learning by doing") must also be incorporated and adapted to the practical needs of medicine. Small group teaching, as well as academic and personal tutorials, and PDP systems can contribute to increased education quality, with minimal additional expenses and/or sophisticated high technology equipment, but would provide efficient methods for developing a coherent academic system within the EU.

One prejudice which should be rejected is that teaching and learning anatomy through virtual reality is an enemy which aims to substitute real dissection. Instead, it needs to be viewed as a useful method that complements approaches to anatomy through the cadaver. It is also the case that the opposite view sometimes taken that virtual anatomy can provide a complete substitute for prosected and plastinated specimens is also wrong; the approaches need to go hand in hand. It is also important to keep a rational balance and integration between macroscopic and microscopic anatomy. This is arguably easier if taught by a single rather than by different departments. Similarly, for teaching staff it will be easier to maintain a good balance if individual staff are involved in many aspects of the subject (whole body anatomy, neuroanatomy, embryology, histology) rather than in a single aspect which they might then tend to overemphasize. It is also important to obtain a satisfactory balance between all the various duties of staff: teaching; administration; personal research; guiding students' research. While this may well vary within the working life of any member of staff, what will be important is the achievement of some equality throughout the EU of the total load of teaching, research and administration. This would require some

agreed methods of evaluation of the professional contribution of staff and this will not be easy to achieve.

Concerning interchangeability of courses, horizontal and vertical integration of courses that differs between programmes could be a major problem. Another very important consideration is that of assessment, both for establishing competency and as selection criteria for different professional purposes. The different methods available: use of spotter, steeplechase type, examinations, essays, short answers, questions: true-false, single best answer, multiple choice (MCQ), extended match questions (EMQ), combined, viva voce examination test different aspects (see below), and it is important to define those assessing competence, which should be interchangeable, from those assessing the degree of achievement above competence. Other aspects of the students' progress now need to be included in any assessment. Some schools consider that an honours degree classification system stimulates and increases students' motivation for learning. The major difference between assessment methods is that practical spot examinations, written paper(s), viva voce exams all require production of an answer from the student's memory, whereas false-true, single best answer, MCQ, EMQ assessments all require the student to select from a bank of options. They therefore assess different capabilities. Apart from anatomical knowledge, assessed competencies should include practical and theoretical professional skills and attitudes, communication (writing, presentation skills), ethical and professional development.

If medical courses and qualifications are to be transferable, assessments should ensure good comparability between different schools, both within a country and in different countries. In the absence of national examinations, extending the use of external examiners, which is routine in UK and Ireland, across the EU will be necessary to ensure greater objectivity and more comparable standards. Evaluation of students' "core" knowledge would require an agreed "core" syllabus. In this respect, ASGBI have produced and published (2003) a proposed outline of the core knowledge of anatomy, as a benchmark that its Education

Committee felt should be expected of medical students and young doctors. An updated version of that syllabus is published as part of this Symposium (McHanwell et al., 2007)

The considerations outlined here might well be tasks for the Trans-European Pedagogic Research Group for Teaching Anatomy (constituted at Professor Moxham's initiative) and the Federative International Committee on Anatomical Education. In particular, three examples may be considered from the British and Irish practice: the tutorials; the use of external examiners; and the design of a general benchmark.

It is very important here to emphasize that interchangeability within the EU should mean comparability of outcomes and not uniformity in teaching methods. Comparable evaluation/grading of core knowledge will, of course, be important to establish compatibility and comparability between different universities and to ensure equal chances for all EU students.

In conclusion, if EU enlargement is to have useful benefit for anatomical education in medicine, a set of benchmarks similar to that produced by ASGBI (McHanwell, 2007) on anatomy, neuroanatomy and embryology and an inventory of criteria to be assessed, need to be designed, agreed, and spread throughout the medical schools of the EU for general use.

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