

European Module  
**EMUTOM**  
for Undergraduate Teaching of Occupational Medicine

**CURRICULUM DEVELOPMENT  
EMUTOM**

Final Report

Public Part

## Project information

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Beneficiary organisation:	Ghent University (Belgium)
Project coordinator:	Lutgart Braeckman
Project coordinator organisation:	Ghent University
Project coordinator telephone number:	+32 9 332 36 91
Project coordinator email address:	<a href="mailto:lutgart.braeckman@ugent.be">lutgart.braeckman@ugent.be</a>

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## Executive Summary

EMUTOM is a project aimed at enhancing cooperation between European medical universities through the design of a module for teaching health and work issues that allows for harmonisation and transparency in terms of competencies and learning outcomes. For most people work is essential for economic, social as well as physical wellbeing. All medical doctors, whichever speciality they practice, have a key role in the prevention of work-related disease and the promotion and maintenance of good health. Educational experts and specialists in occupational medicine from five different countries (Belgium, France, The Netherlands, Romania and Serbia) offer a research based module in the form of blended learning for qualifying future health professionals in issues around work and health.

The target groups that were reached during the life of the project, are undergraduate students in medicine, academics and staff members of the participating universities as well as professionals in the field. The long term target groups are students in health sciences e.g. nursing but also other disciplines and institutes may benefit from the experience of providing a European joint module on occupational medicine.

In order to reach the general goal, some specific objectives were accomplished: the examination of the undergraduate medical curricula with regard to work-related issues throughout Europe; the analysis of the needs among general practitioners and medical specialists in the partner countries; the development of a competency framework, associated teaching materials and resources; and finally the design of a quality policy.

The surveys on undergraduate teaching concerning the link between work and health and the analyses of needs among several groups of practitioners were completed in the first phase of the project. First, a lack of standardised preparation for practice in these topics across Europe was identified. Whilst some countries have a robust training at medical undergraduate level, others have little or none. Second, differences in needs and demands were observed between countries on one hand and between occupational physicians and general practitioners on the other hand. These activities enabled the partners to formulate core competencies, learning objectives and construct the module and a teaching format. The module includes four chapters: general introduction to work and health, effects of work on health, fitness for work, and workplace health promotion. The module is delivered as a 5-day taught programme in a three weeks period with a student workload of 84 hours. A prototype module did run on test-basis during six months and was evaluated by developers, students, teachers and experts. Based on the evaluators' feedback, the module content was optimized and refined. The final results and training materials including a teacher manual can be found at [www.emutom.eu](http://www.emutom.eu) and all interested parties can use the material free of charge.

Last, a quality management system was also developed so as to regulate partners' performance in the process and guarantee outcomes and further implementation.

All partners were active in the dissemination and exploitation of the EMUTOM module and the actual project results into their own networks. Dissemination has involved informing the academic community in each partner institution on the progress in the development of the module and getting professionals from the field

also involved in the debate. Results of the surveys have been presented at local meetings, during EASOM Summer Schools (Rouen 2011 - Berlin 2012) and at international congresses (ICOH Cancun March 2012). The presentation of all outcomes and module at the final conference in Timisoara (September 2012) also contributed to the dissemination of the project among a group of European experts and scholars in the field of occupational medicine.

Finally, activities to guarantee the project's sustainability beyond the project's lifespan are scheduled : another survey on continuous professional education in occupational medicine across Europe forthcoming in winter 2012 and joint publications on the development, implementation and evaluation of the module.

Further details on the project, its participants, activities, results and full contact address are available on the website [www.emutom.eu](http://www.emutom.eu).

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# 1. Project Objectives

The primary aim of the project was to provide within the framework of the European Higher Education Area a teaching module covering the basics of occupational medicine at undergraduate level. The intention was not to develop a specialist-training course; it was to extend awareness and relevant knowledge of work and health topics among people who need to manage or advise on these issues.

This general goal has originated in the need to harmonise and strengthen the training materials available to medical students throughout the EU, particularly in countries where no undergraduate programme exists. Promoting work ability, avoiding occupational diseases and injuries not only affects workers' health, but also brings less costs and more benefits for companies as well as society.

In addition, we aimed to enhance medical students' interest in this field and encourage them to consider occupational medicine as a career.

To deliver a coherent module and an integrated learning experience for an international student body, following objectives were included :

- To assess the level and content of the teaching of occupational medicine in the undergraduate medical curricula throughout Europe. This allowed us to identify common approaches and topics but also to reveal the intellectual and cultural diversity between countries.
- To take into account the experience from key players in the field by launching a survey examining their perceived needs and compare them with the ideas and proposals put forward by the academics.

These inputs together with educational principles did set the basis for a blended learning strategy. The structure and methods of the module has capitalised on the knowledge and competences of the academic community and that of several stakeholders and professionals in the field of medicine and health sciences.

Concordance between course content, pedagogy and teaching relations was fundamental for the integrity of the module and its impact.

Quality assurance mechanisms were inclusive; they have foreseen student involvement as well as involvement by staff faculty and external experts.

The final result is a tailor made module ready to be implemented in the medical curriculum. Current and future students in the partner institutions were the short-term target group and they will immediately benefit from this project. In the long run, study of this module may also be beneficial to other health professionals who are likely to encounter a variety of work and health issues in their daily practice.

## 2. Project Approach

The project is focused on the study and development of a common framework that enable medical students, staffs and physicians to prevent and recognize work-related health problems. The project consortium united five universities, geographically distant from one another, with very different academic cultures but all of them were committed to bring their specialized knowledge and create a learning module with a high level of quality.

In order to accomplish key objectives, the project has been divided into two phases. The first phase, conducted during the first year, has been composed by three parallel but connected activities:

First, from national surveys carried out in some countries, we knew that large gaps exist between and within countries with regard to the training of health professionals in this specific field. A questionnaire was designed to capture detailed information on the teaching of occupational medicine to undergraduates and this was sent to all medical schools in Europe (n = 283). Results from this survey have served as help for the identification of the learning outcomes and enabled the development of a balanced module that not only met the needs but was also within the bounds of possibility in different countries.

Second, learning objectives have been usually formulated by staff members of the universities. We knew little about the 'work and health' competencies as experienced by stakeholders e.g. patients, general practitioners and medical specialists. In order to approach a joint map of competences, a convenience sample of stakeholders in the partner countries was invited by letter to complete an open answer questionnaire. They were asked to articulate which 'work and health' competencies, according to their opinion, medical students should have at the end of their medical study. And next to prioritize their answers. By examining their opinions, it has been possible to discuss the direction the module should take. In this way the teaching programme responded to the needs perceived and recognized by professionals as important.

Third, the elaboration of the overall structure and content of the module, based on results of the above mentioned research. This was the core of the project. The issues covered in the four chapters of the Module are areas of concern in many European countries and workplaces. Each of the partners has prepared the didactic products attributed according to the field of excellence. The integration between individual course packages has been warranted as each of the partners acted as co-author for multiple packages and they have met regularly. Pedagogical aspects have not been neglected.

Quality assurance mechanisms were inclusive : a quality control system has been developed, and has regulated partners' performance in the whole process and guaranteed outcomes and implementation.

In the second phase, the pilot module has been implemented and tested : an online evaluation questionnaire has been set up separately for teachers and students on the content of the module chapters and the lay out of the website. Critical evaluation by small groups of students, faculty staff and external experts has permitted the last corrections and creation of new materials before opening the contents to all

interested parties. In addition to the content validation, increase in knowledge and self-efficacy beliefs have been assessed in Belgian medical students from the third year at Ghent University. By engaging many interested educators and learners in the evaluation and discussions, dissemination of the projects' outcomes has been continuously been promoted and the impact strengthened.

Ultimately, the project approach has generated a course that has set a quality reference point and benchmark for improving the supply of qualified health professionals required in the coming decades to deal with the special needs of the working population and to generate evidence on workers' health and to translate that evidence into policy and actions.

### 3. Project Outcomes & Results

We reached positive results during the two years of the project's lifetime. One of the most interesting experiences has been to contrast the divergent opinions of partners and target groups as conditioned by national cultural and academic traits.

Sharing a first approach to European curricula has indicated different traditions. One hundred and twenty nine medical schools (response rate 48%), representing more than 100.000 undergraduate students, have returned a completed questionnaire. Despite the European harmonization, wide intra- and inter-country disparities have been observed. The majority had specific lectures on occupational medicine but the amount of teaching ranged from 2 to 80 hours with a mean of 27 hours. Occupational respiratory diseases, occupational cancers and toxicology were the most frequently taught, whereas assessment of disability and return to work in less than one half.

For the development of a European Module, agreements on learning outcomes among academic staff and stakeholders have been valuable. Answers on the open questionnaire have been received from professionals in outstanding positions on the one hand, and on the other hand from patients in six countries. Results have been gathered and attributed to categories independently by two researchers. A large majority of the necessities were common and have formed a solid basis for a European Module. For the issues where differences have been established, compromises have been found.

Having identified the most important competencies in opinion of all target groups, the structure and content of the module have been agreed upon by all partners, including some differences and affinities among countries. Four chapters have been developed within the Module: 1) general introduction to work and health (including legal and ethical aspects, structure and role of occupational health care), 2) effects of work on health (occupational diseases), 3) fitness for work, and 4) workplace health promotion. A format has been developed and it has been decided that each course chapter had an advanced organizer, learning objectives in terms of the student, body of the chapter, referral to the general frame of the course, summary with key elements, key words, competence-based assessment in relation to the course content (e.g. student assignment and multiple choice questions) and feedback on the assessment.

In the pilot project implementing the Module, a 360° assessment and a multi-actor perspective for evaluation purposes has been applied: developers, students, teachers and experts have been invited to provide feedback and formulate advice.

Several quality control actions have been undertaken in the second year :

- Evaluation of the development approach (use of the format) by questioning the European partners by means of the Metaplan method during the Project meeting in Rouen, October 2011.
- Students from each partner university have been enrolled in order to test the content and to find out whether the programme really meets the aims and objectives. They have been invited to fill in an online questionnaire and afterwards a discussion group has been organized. A small group was better

to work with within the test phase, so it was decided that every partner should enroll a minimum of 5 students for the test phase.

- In order to gain specific competences to protect and promote workers' health, not only is the development of conditional knowledge and skills needed, but also related beliefs about one's personal efficacy. Bandura (1997) defines self-efficacy as students' judgments of their capabilities to successfully perform specific tasks. Research is rather consistent as to the relationship between high self-efficacy levels and resulting learning performance. Medical students of the third year at Ghent University, Belgium have been assessed before, during and after the implementation of the Module. The tests were composed of 10 multiple choice questions (MCQs) and of 20 statements on occupational medicine : ten items that cover more conceptual knowledge and ten items that cover skills elements. Students were asked to indicate on a scale from 0 to 100, the degree of certainty that they have knowledge/mastery of subject matters concerning "Work and Health". An increase in mean values for both outcome variables (knowledge and self-efficacy) has been observed.
- Simultaneously a strategically relevant group of teachers and experts has been approached to comment on the content of the different course packages according to their specific qualifications and experience. They have crosschecked the materials for acquisition of the learning objectives, the appropriate difficulty level (undergraduate), repetitions or lack of topics etc.

The results of the online questionnaires, the discussions and the assessments have been of enormous value to refine the pilot version of the Module. Overall, we received positive comments and some minor chapter related remarks; there was a need for more cases and more MCQs.

The final version is a blended learning module with materials free available online ([www.emutom.eu](http://www.emutom.eu)). This introductory course is delivered as a 5-day taught programme within a three weeks period with a student workload of 84 hours (3 European credits). The information and the material is directed both to those who teach medical undergraduate and also to undergraduate themselves. In order to make the course as relevant as possible to the target group, namely undergraduate students in Medicine or other Health Sciences across Europe, it has been recommended in a Teacher Manual to adopt the Module to the specific concerns and needs in the own country.

Evaluation reports of the EMUTOM Module by students and experts have been drafted, in addition to a general quality report.

The surveys and evaluations have allowed us to present the project to university colleagues and students in order to enhance interest in the Module and the field of occupational medicine. The partners took care of disseminating the information through presentations and poster sessions at local meetings and international congresses, including a final conference in Timisoara (September 2012). Special PowerPoint presentations, speeches and leaflets (in six languages) were made for that purpose.

Information about the different products, description of activities and presentations of results is available at [www.emutom.eu](http://www.emutom.eu). The website is now under management of Ghent University.

Finally, more activities that will take place along these coming months will guarantee the sustainability of the module development.

## 4. Partnerships

The partnership was composed by 5 universities from countries that cover different regions of Europe : Belgium, France, The Netherlands, Romania and Serbia. By cooperating with a partner from third countries, the Emutom project partnership has been well representing the objective of the programme namely *"contribute through lifelong learning to the development of the Community as an advanced knowledge-based society"*.

The human resources that each partner has made available are figures with a high level of qualification and with an appropriate professional experience.

- Ghent University (BE) was the leading coordinator of the project. Inside of the coordinating institution following experts were integrated as partners : prof dr Lutgart Braeckman (Department of Public Health, Occupational Medicine, coordinator), prof dr Anselme Derese (Department of Family Medicine and Primary Health Care), prof dr Tom Defloor, Dr Ann Van Hecke (Department of Public Health, Nursing Science) and prof dr Martin Valcke (Department of Educational Studies in the Faculty of Psychology and Educational Sciences). Several researchers of all these departments have contributed to the project : the multi-disciplinarity of the Belgian team facilitated the creation and the evaluation of the Module in relation to personal interest and experience.
- Centre Hospitalier Universitaire de Rouen (FR) with the participation of prof dr Jean Francois Gehanno who has a great experience within risk assessment and information retrieval methods;
- Coronel Institute AMC (NL) with the participation of prof dr Frank Van Dijk, responsible for the department and very active in international curricula development and dr Paul Smits, expert in evaluation research of medical education;
- University of Medicine and Pharmacy "Victor Babeş" (RO) with the active participation of prof dr Elena-Ana Pauncu, who has great expertise in creation of curricular contents together with dr Florina Popescu and dr Madia Hanna.
- University of Belgrade (SE) with the participation of prof dr Petar Bulat, who is a renowned expert in occupational health. The involvement of Serbia should be seen as an added optional element in the project, though one which contributes clearly to the added value of the project as a whole.

The project has enjoyed the cooperation and support of the European Association of Schools of Occupational Medicine (EASOM) and the European Union of Medical Specialists (UEMS), Section of Occupational Medicine. The EASOM Summer Schools and UEMS meetings have provided a platform for immediate access for and to representatives of Schools and national associations of Occupational Medicine from all EU countries.

From the first phase of the project activities emerged already the added value that the partnership could bring to the project. With involvement of all partners it has been possible to identify a much wider range of 'stakeholders and key players' to question than would have been possible or likely if the surveys was being completed by one or two partners only. The contact with the non-academic world (the advice of experts,

the cooperation of patients, practitioners etc..) has created a clear win-win situation in this project for all parties from all countries involved.

The project partners are themselves stakeholders interested in the use of project results. All play an influential role in their countries and act in the interest of policy makers, universities and associations to support the socio-medical and cultural territory development. Their direct involvement in the organization of national seminars and their contacts with European key players for the exploitation of results, guarantees the sustainability and the adoption of the results achieved in the project by a wide range of stakeholders.

## 5. Plans for the Future

During these two years we were able to meet the objectives, produce significant deliverables and advance substantially in the development of a teaching module on the basic tenets of occupational medicine on which the whole partnership agrees.

At the end of the project's lifetime a refined and enriched version of the EMUTOM module - free available at the new website - was presented to the audience at the final conference in Timisoara (September 2012). There were about 30 participants from 9 countries. A lot of discussion took place and several ideas were put forward: the EMUTOM module is seen as an additional source in support of undergraduate (and even postgraduate) training of occupational medicine. It provides a common frame of reference for teachers with or without a background in occupational medicine and the structure of the module with cases, assignments, self-assessment exercises, feedback, etc. offers users support to use this frame for teaching or learning. Participants of this conference reported the use of some parts of the module in their curriculum, but also acknowledge that more promotion in other institutes in their country and connected countries is needed. Step by step implementation of the module seems feasible. Nevertheless, language literacy was perceived as an important barrier to the implementation of the EMUTOM module in some countries, which stresses the need for translation.

It is the intention of the partners to continue the co-operation and to sustain the project results by involving interested colleagues from other institutions and countries in the translation of parts of the module. An updated European module will be offered year after year. The final goal is to have the module as a part of the regular curriculum in health care higher education in the partner countries and all over Europe.

Other plans for the future include the publication of the survey results and the evaluation of the module by students (one joint article submitted to an international journal and one in progress). Contacts have been established with Academia Press at Ghent University to publish the word documents of the Module in a textbook available at a reasonable price for students.

Some new activities are already scheduled the forthcoming months : on initiative of EASOM and UEMS we discussed at the final project meeting an adjusted version of our survey questionnaire. At the end of 2012 we will send this questionnaire across Europe to make an inventory of postgraduate curricula in occupational medicine. Providing a harmonized and standardised training programme for postgraduate and/or continuous professional training in occupational medicine are possible topics for submitting a new project. In this proposal, a good initiative could be the exchange of teachers and students. There are grants for mobility including the bilateral agreements within the LLP Erasmus.

In March 2013, the yearly conference of all the German speaking societies for Occupational and Environmental Medicine (Austria, Germany and Switzerland) will be organized on the topic "Occupational medicine in Europe" in Bregenz (Austria). The Emutom project has been given the opportunity to present his results and teaching module at this conference.

In August 2013, the 13<sup>th</sup> EASOM Summer School is planned at the partner institute in Timisoara on the following topic “Worksite Health Promotion”. During these sessions and workshops, teaching staff meet to discuss teaching/learning strategies that could be disseminated among European member universities. The material from the EMUTOM Module (chapter 4) will be discussed and new important material for the website can be produced and disseminated. Moreover, a follow-up EMUTOM meeting is fixed during this summer school in Timisoara (31 August 2013 at 13h-16h).

## 6. Contribution to EU policies

The Emutom project took care to contribute to a variety of European Union policies in the area of the Objectives of the LifeLong Learning Programme.

*To contribute to the development of quality lifelong learning and to promote high performance, innovation and a European dimension in systems and practices in the field*

This project has developed a new innovative European Module in Occupational Medicine (OM), promoting lifelong learning in this field. The consortium is well spread over Europe, covering all 'corners'. The Module has a strong emphasis on European aspects and comparison (European Law, European Labour Politics) but, at the same time, it has offered the opportunity to bring in specific situations and practices from the various regions.

At the national level, standards of competences were not so common : because of the nature and the level of the selected partners, their networks and the contact with the non-academic world, this common project has promoted higher education standards and higher performance in learning in the EU.

*To support the development of innovative ICT-based content, services, pedagogies and practice for lifelong learning*

The project was about developing a blended learning module, aiming at undergraduate medical students, living and studying in various countries. Until now, different aspects have complicated the quality and quantity of teaching occupational medicine across Europe : lack of time, increasing number of students and no available specialist in OM among faculty staff. Special attention was given to the development of the online module, a well-structured digital learning platform and e-learning techniques. This has led to an improved technological capability for all students and partners that co-operated in this project.

*To support the achievement of a European Area of Higher Education*

Partners from five European institutions have been involved in a project to upgrade and harmonise the undergraduate teaching of OM. The partners are all specialists representing a wide range of areas of expertise in occupational health and are all involved in teaching work and health-related issues at their respective institutions. In addition, some are also working clinically with patients experiencing an occupational disease or a disability. They thus provided a unique combination of research, clinical and teaching expertise.

Through the module health professionals are better prepared to define and manage the major occupational health problems and give advice on fitness for work which in the end will contribute to a healthier European population and workforce.

*To improve the quality and to increase the volume of multilateral co-operation between higher education institutions in Europe*

Learning materials have been contributed by all participating universities, thus providing a multicultural view of a wide range of issues relating to occupational medicine. The exchange of knowledge and the learning methodology, based on best practice examples, has increase the quality of education in the different European

member states. Moreover, the translation of selected project products in the languages of the partners, has helped to establish the multi-cultural nature of the project.

*To facilitate the development of innovative practices in education and training at tertiary level, and their transfer, including from one participating country to others*

The current project has contributed by encouraging communication and collaboration between educators, experts and students in a European dimension through innovative pedagogical and didactical approaches (e-learning, self-assessment etc). The joint development of the module has led to a useful exchange of ideas and experiences. New and more student-centered teaching methodologies have been introduced to some of the partners, while others have been able to consolidate their more innovative practices.

