PROJECT MEFANET – 5 YEAR EXPERIENCE WITH DEVELOPMENT OF COLLABORATIVE PLATFORM SUPPORTING MEDICAL AND HEALTHCARE EDUCATION

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Abstract

The MEFANET – MEdical FAculties NETwork – has initiated international and open cooperation among all Czech and Slovak medical faculties since 2006. The MEFANET projects aim to develop new electronic teaching tools and origin educational solutions in medical and health care fields using modern information and communication technologies, which are available for both teachers and students. This paper describes the MEFANET progress overview and introduces fundamental principles related to electronic support of medical education. All chosen approaches fully respect independence and different requirements of each medical faculty. The base of the MEFANET success and key activities are reported here, as well as mechanism of a new multidimensional digital content quality assessment.

Key words: e-learning, computer communication network, quality assessment tools, medical education

MEFANET history in brief overview

The idea of sharing educational digital contents among Czech and Slovak medical faculties occurred for the first time in 2006. Soon afterwards in 2007, seven Czech medical faculties as well as all three Slovak medical faculties formally established the network using brand title MEFANET (MEdical FAculties NETwork). This core part of the network further expanded in period 2008 – 2010 and attracted other educational institutions including research centers from Academy of Science of the Czech Republic and faculties focused on health care education and biomedical engineering. In 2010, newly established Medical Faculty in Ostrava entered the network as the last member. We can conclude,

that all medical faculties in the Czech Republic and Slovakia currently collaborate in fully functional network supporting electronic education in a wide range of medical and health care science. Instead of a centrally organized consortium, the participating subjects created the network from the bottom up by joining their educational production and skills. The network further initiated a new tradition of educationally oriented annual conferences where both teachers and students can share their experiences with ICT in medical education. Currently, the MEFANET network serves to approximately 4,000 teachers and to almost 25,000 medical and health care students, providing them with electronic learning objects from all participating schools and institutions.

In 2008, the network launched its central gate as a tool integrating the information presented in all the portal instances of individual members. The entry to the gate, as well as all project information and results, are available on the MEFANET website: www.mefanet.cz. Starting from the very beginning of the collaboration, the centralized support for the web-based and user-driven learning solutions was open for other potential partners, both universities and other academic institutions interested in medical education. Only two conditions are maintained as inescapable and obligatory for all members; they are required to accept (1) the uniform taxonomy of medical disciplines and (2) the Shibboleth system of authentication. Universal taxonomy of medical disciplines serves as a dominant filter unifying access to learning objects from any point of the network (http://portal.mefanet.cz/index-en.php). The taxonomy consists of categorized disciplines implemented as key words in all searching tools. The categorization of disciplines respects commonly adopted standards and compromises it with teaching curricula of involved faculties.

The network still extends its activities and future growth in content production can be expected, namely thanks to diversification of horizontally collaborating teams and many important sub-projects initiated. Any member of the network can initiate its project under the umbrella of the MEFANET network and can use the brand of the network, its centralized tools and support. Such, mostly locally invented, activities are then easily disseminated throughout the network searching for active partners and users. Currently, the network is supported by five influential projects specialized on methodical issues of medical e-learning. The network thus fulfils its principal aim, i.e. to facilitate the cooperation among teams from different faculties, and to ensure a horizontal accessibility of electronic teaching tools for both teachers and students.
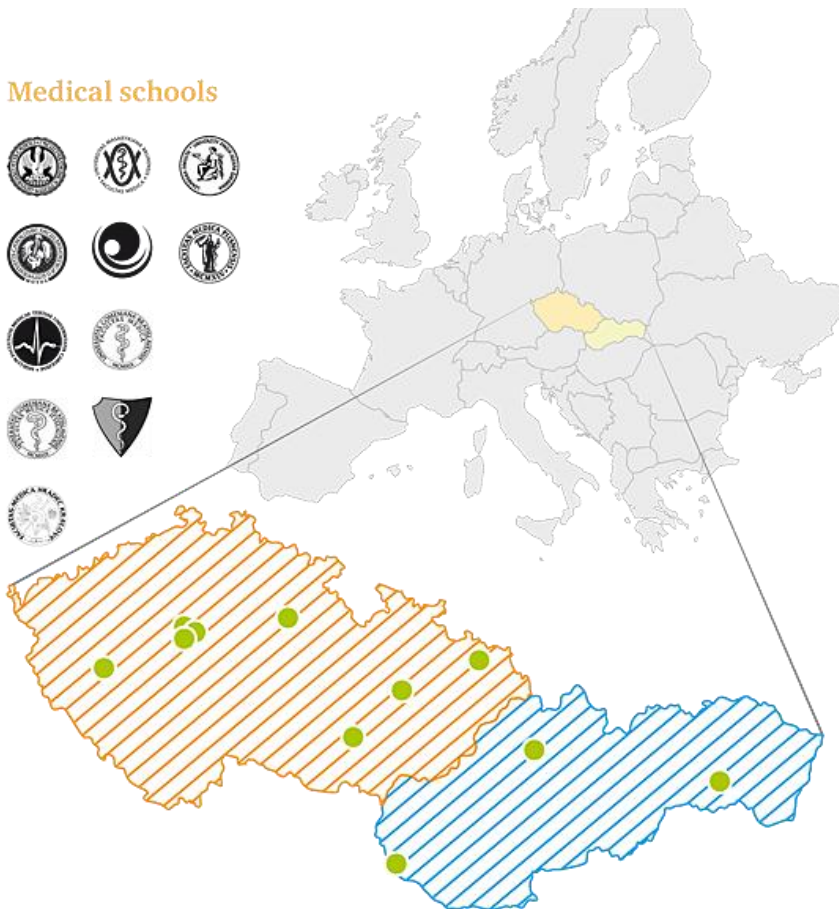
Fig 1: Czech and Slovak medical faculties involved in the MEFANET network

Principles adopted for the MEFANET organization

1. The MEFANET project is a voluntary initiative which promotes an equivalent cooperation among medical faculties. Nevertheless, the MEFANET is open for cooperation with other subjects, particularly academic institutes involved in the education of medical or health care disciplines.

2. All activities of the MEFANET project, including the way of solving common projects, respect the independence of individual faculties. Members of the network can utilize common brand, central support and tools.

3. The MEFANET project promotes an entirely academic cooperation, where financial resources need to be acquired in the form of educational and/or research grants. Activities of the MEFANET project do not generate any expenses which could affect internal budgets of participating faculties. It is expected that fixed and maintenance expenses associated with optional activities within the MEFANET project would be covered from own resources of the respective faculty. The MEFANET project does not keep central financial resources.

4. The project is supervised by the Coordination Council, which consists of 1-3 representatives from each participating medical faculty. These representatives are appointed by the Dean of the respective faculty. If a common decision has to be made, each faculty has a single vote to be applied. The Coordination Council is convened and presided by the Chairman, who is elected by representatives of the participating faculties for the period of two academic years.

5. The Coordination Council establishes the priorities of MEFANET activities, decides on generally acceptable standards for individual types of outputs, and helps to define and solve common projects.

6. The Coordination Council does not intervene in the system of education at individual faculties: the participation in specific initiatives and/or standards is subject to approval by the management of individual faculties.

Base of MEFANET success: respect to the independence of members and support for all reasonable sub-projects

The MEFANET project was not initiated to affect or to control teaching strategy at individual faculties: all targets of the MEFANET project fully respect the independence of participating subjects. The project is primarily focused on the creation of methodical materials and standards, which would subsequently facilitate the cooperation of participating teams of teachers. Each participating faculty is expected to follow its own priorities of development, while the cooperation will only consist in mutual awareness, methodology standardization and sharing the works of authorship. If one faculty uses educational materials and tools of another faculty, owner's rights and copyright of the latter faculty must be respected. These rules will also apply to other

Czech and Slovak universities which already joined the project. Key activities of the project are secured by mutual contracts among participating subjects (e.g. contracts between university hospitals and medical faculties on the usage of database of clinical images etc.).

All subjects participating in MEFANET network as well as all local teams of teachers are challenged to propose and to initiate their sub-projects which finally enrich the content and/or methodical skills of the whole network. Especially valuable contribution comes from horizontally organized consortia of teams from different faculties, typically collaborating in development of some educational materials, atlases or courses published in LMS. From the methodical point of view, the network MEFANET currently encompasses five important sub-projects which develop some kind of centralized solution with potential to support partial activities in all faculties. These projects focus on development of some innovative SW tools, on implementation and localization of internationally used solutions as well as on facilitation of communication within the MEFANET network. Each of these activities started in past as initiative of some local or regional team and subsequently the outcomes were spread in the whole network. Following list briefly introduces scope of these activities, further information can be found in the network portal www.mefanet.cz:

1. **E-publishing system.** MEFANET developed an original and uniform solution for educational web portals which are used, together with a central gate, to offer and share digital educational content. The educational web portal is an official publication platform of the network, which serves for publication of electronic educational works and multimedia teaching materials. Its main task is accessibility to all types of electronic didactic materials developed across the whole network. There are currently eleven portal platforms developed within the MEFANET project covered by a central gate that allows for effective searching within the whole content available. The local portal instances do not replace LMS systems at the medical schools. Compared to the LMS, the educational portal platform provides additional e-publishing tools with well-defined rules for quality assessment. Further, it allows users federated authentication, and so they do not have to create separate user accounts for each portal instance. Central gateway is available at http://portal.mefanet.cz/index-en.php.

2. **WikiLectures.** Intensively growing project which provides space for a cooperative production and storage of medical teaching materials

created for students and teachers of all Czech and Slovak medical faculties. The activity is focused mainly on pregradual education and is continually filled with educational texts. An editorial team has been established to provide support for authors and to control quality and rules. The most important contribution of the WikiLectures is simplification of teaching materials, easy updating, and inspiring cooperation with people interested in the same topic. Final texts should not be in a form of encyclopedia, but rather short texts similar to chapters in a textbook. Very interesting added value of the project is active participation of medical students in updating and editing of texts. WikiLectures are available at http://www.wikilectures.eu.

3. **Moodle-MEFANET.** Besides the two existing tools for publication and sharing of electronic educational materials within the MEFANET network (e-publishing system and WikiLectures), there is another widely available tool: space for production, sharing and operation of e-learning courses. Moodle belongs to learning management systems and is available as Open Source under the GPL open licence. It integrates various tools for materials sharing and study control. Among others, the system allows users to manage access rights, perform evidence and administration of courses, study plans, students' activities, contains tools for creation, operation, and evaluation of teaching courses and objects, students' examination, etc. Central agenda of the Moodle MEFANET team provides methodical materials, guides and standards for effective LMS-based production of educational materials. Moodle-MEFANET is available at http://moodle.mefanet.cz/.

4. **MEFANET annual conference.** The MEFANET conference is organized as traditional annual meeting focused on methodical progress in ICT-based education of medical disciplines. The conference provides an opportunity to medicine teachers and students to meet medical informatics professionals, as well as experts involved in the multimedia support of education. The meeting represents one of the main communication platforms of the network.

5. **Eduport.** Newly initiated sub-project focused on portal presentation and advertising of a wide range of educational material. Principal aim of the activity is to facilitate communication and networking of teams and individuals among participating faculties. The Eduport communication platform should also make educational materials more easily accessible for students.

Content above all? Quantity and/or quality?

MEFANET members primarily decided to develop an original and uniform solution for educational web portals, which are used, together with a central gate, to offer and share digital educational contents. Recently, this unique collaborative environment has been growing in content reaching hundreds of shared resources. However, increasing number of published items opens a question on content quality and arrangement. The products are of different type in terms of technology used (e.g. LMS courses, multimedia atlases or PACS image repositories) and of different complexity. Therefore, widely respected framework for classification of the content as well as standardized guidelines for quality assessment are needed. The experience from many similar projects is that these standardizing rules are vitally important in extensive phase of project life cycle, otherwise the impact of the production is decreasing.

The basic units controlling quality are inevitably participating faculties themselves. Each network member is responsible for the quality of shared learning objects provided as a contribution to the network. There are two principal procedures for the quality evaluation at the level of publishing faculty, "signatures" of guarantees and reviews. Both approaches to the evaluation could be ideally combined. In the first case, the dean or other academic authority nominate guarantor(s) for each of the disciplines in the MEFANET subject taxonomy. The guarantors are then automatically and permanently informed about new submissions on the portal; using the back-office application, he/she can mark the object as accepted or refused. Furthermore, the object may be recommended for a review. The editorial committee of the faculty considers the recommendations and arranges the review procedure. Successfully reviewed objects are marked by the faculty logo and considered as a recognized pedagogical work. Although these baseline procedures partially differ among faculties, they follow the same aim, i.e. to distinguish and approve content of published educational tools on the basis of standard peer-review process.

The second stage of quality assurance is implemented at the level of central portal gate of the whole network. Recent developments have been focused on a new set of tools for quality evaluation of the published contents. MEFANET network calls this set of tools as „4-D model for digital contents quality assessment", because the system is formed by four steps or dimensions:

1. review (usually performed in the publishing subject, faculty),

2. typological classification of the work (type of the work, e.g. educational digital video, LMS course, etc.),

3. classification according to the target group (e.g. introductory, basic content, pre-graduate level, etc.),
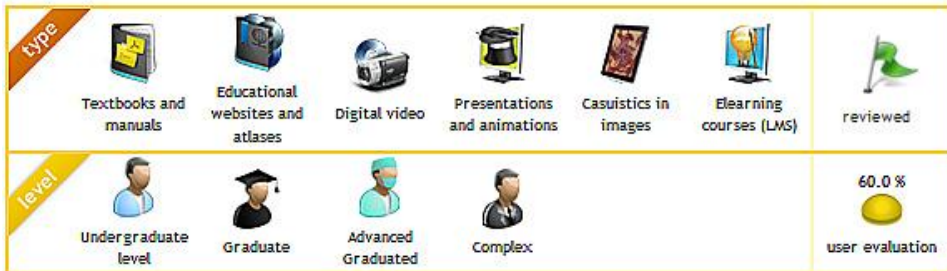
4. users' self-study score.

Fig 2: 4-D model for quality assessment of educational contents

The multidimensional model promises a wider range of tools for organizing the published contents as well as a possibility to present the contents completed by comments from tutors selected from expert medical societies. This system also unifies final classification of educational materials published by different faculties or by different teams.

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