Education in Medical Informatics and Bioinformatics

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Healthcare professionals are increasingly confronted in their work practice with computer-based applications, like the EPR and clinical decision support systems. The use of such systems may sometimes provide problems to clinicians but training in the use of these systems usually is enough to use the system without problems. But being able to use an information system does not imply that no problems will be encountered anymore. Problems can occur when the use of the system does not fit with the workflow of clinicians. When developing information systems clinicians should play a role. However, clinicians only can contribute when they also have enough knowledge about biomedical and health informatics (BMHI). So at least some of the clinicians should get education in this field. But it becomes increasingly clear that all clinicians should be introduced to BMHI. Since medical informatics is sometimes considered to be about computer technology the conclusion was that clinicians do not need such an education. Martin-Sanches and Gray [1] correctly state that this interpretation of BMHI devalues the academic discipline. Clinicians need to be taught medical informatics, but medical informatics interpreted as the science of information, information being data plus meaning. The question then is what subjects should be taught to medical students.

IMIA, the International Medical Informatics Association, has recently published the first Revision of the Recommendations on Education in Biomedical and Health Informatics [2]. It supersedes the original Recommendations that were published 11 years ago. BMHI has changed so rapidly that the Revision was badly needed. The IMIA recommendations focus on educational needs for health care professionals to acquire knowledge and skills in information processing and information and communication technology. The IMIA recommendations describe the educational needs using a three dimensional framework. What needs to be taught depends on

1. which type of professionals in healthcare (e.g. physicians, nurses, medical informaticians) one wants to produce,

2. which type of specialization one wants to attain (e.g. IT users, medical informatics specialists) and

3. in which stage of their career (bachelor, master, doctorate) the students are.

Recommendations are given for courses/course tracks in biomedical and health informatics as part of educational programs in medicine, nursing, healthcare management, dentistry, pharmacy, public health, health record administration and informatics/computer science as well as for dedicated programs in BMHI.

This special issue on Education in Medical Informatics contains a number of articles discussing and evaluating BMHI curricula in different countries. Most contributions deal with the medical informatics education for medical students.

In the first contribution Gray et al [3] focus on the education of health professionals in BMHI. They review how clinical informatics education has worked in the past and provide future directions. They conclude that the peer-reviewed literature offers a variety of recommendations on what to teach and why to teach it. However, there is a paucity of literature that goes beyond learning needs, competency specifications and content outlines. According to them more should be published about what is involved in making such education a reality and on the experience of staff and students who participate in it.

Martin-Sanches and Gray [1] propose a definition of BMHI as the science of information applied to or studied in the context of biomedicine. The authors describe several misconceptions about this scientific and professional discipline. They describe the current international situation of BMHI with respect to education and research. Then they analyse the situation in Spain and Australia.

Behrends et al [4] describe the problems they encountered when they tried to integrate the topic of medical informatics in the third year of a new medical curriculum. Medical students appeared to have misconceptions about the role of medical informatics and did not understand why they had to deal with this subject. To alleviate the situation they used the feedback given by students to improve the way medical informatics was taught. The evaluation of the education by the students improved to a satisfactory level.

Kern et al [5] describe the medical informatics program and training at the School of Medicine of the University of Zagreb, Croatia. They conclude that medical students are starting to recognize the role of information in their future profession.

Zvarova et al [6] describe undergraduate and doctoral degree studies in biomedical informatics at the Faculties of Medicine of the Charles University in Prague, Czech Republic. They also describe e-learning tools like interactive books, wiki teaching material, Web 2.0-based e-learning tools and tools for assessing knowledge.

Bari et al [7] describe the most important factors influencing medical informatics education in general, in Hungary and at their faculty in particular. They emphasize that even with limited resources it is possible to create and maintain valuable training programs especially when trans-border co-operation is possible.

Borycki et al [8] describe a new double degree graduate program in health informatics and nursing. The program was designed to prepare nurses with graduate level competencies in both nursing and health informatics.

Adoption of SNOMED CT has not been as quick and easy as many people had hoped or expected. One reason is lack of education and hence understanding of what SNOMED CT does and how it works. Conley and Benson [9] set out to answer the question "who needs to know what" about SNOMED CT to help establish priorities for UK higher education.

The contributions are well written and we hope that this special issue will provide readers with more insight in the way BMHI education is organized in various countries and what the problems and opportunities in setting up programs are.

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References

[1] Martin-Sanchez F., Gray K.: Education, Research and Professionalism in Biomedical and Health Informatics: Myths, Realities And Proposals for the Future. EJBI 2011; 7(1):64–71

[2] Mantas J. et al.: Recommendations of the International Medical Informatics Association (IMIA) on Education in Biomedical and Health Informatics, First Revision. Methods of Information in Medicine 2010; 49 2: 105-120

[3] Gray K., Dattakumar A., Maeder A., Chenery H.: Educating Future Clinicians about Clinical Informatics: A Review of Implementation and Evaluation Cases. EJBI 2011; 7(1):48–57

[4] Behrends M., von Jan U., Paulmann V., Matthies H. K.: Teaching Medical Informatics to Medical Students What are the Challenges in a Model Curriculum? EJBI 2011; 7(1):25–30

[5] Kern J., Fišter K.: Medical Informatics Meets Medical Education: the Croatian Experience. EJBI 2011; 7(1):58–63

[6] Zvárová J. et al.: Biomedical Informatics Education at Charles University in Prague for Undergraduate and Doctoral Degree Studies. EJBI 2011; 7(1):72–78

[7] Bari F. Forczek E., Hantos Z.: E-Health Resources in the Graduate and Postgraduate Medical Education in Hungary. EJBI 2011; 7(1):19–24

[8] Borycki E., Frisch N., McIntyre M., Kushniruk A.: Design of an Innovative Double Degree Graduate Program in Health Informatics and Nursing: Bridging Nursing and Health Informatics. EJBI 2011; 7(1):31–39

[9] Conley E., Benson T.: SNOMED CT: Who Needs to Know What? EJBI 2011; 7(1):40–47