
Editorial

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Biographical notes: Athina Lazakidou works at the University of Piraeus, Greece, as a teaching assistant and at the Hellenic Army Academy & Hellenic Naval Academy, Greece, as a visiting lecturer in informatics. She received her BSc in Computer Science from the Athens University of Economics and Business (Greece) in 1996. In 2000, she received her PhD in Medical Informatics from the Department of Medical Informatics, University Hospital Benjamin Franklin at the Free University of Berlin, Germany. She is also an internationally known expert in the field of computer applications in healthcare and biomedicine, with seven books and numerous papers to her credit. She was also Editor of the *Handbook of Research on Informatics in Healthcare and Biomedicine* and of the upcoming *Handbook of Research on Distributed Medical Informatics and E-Health*, which will be published in 2008.

This special issue focuses on the wide spectrum of all relevant issues and provides a holistic examination of the current status and future trends in learning environments in health sciences. The main aim of the issue has been to bring together informatics experts, practitioners and designers from a wide range of domains, including engineering, health services, usability, biomedical engineering, simulation, artificial intelligence and human-computer interaction, with the intention of providing an overview of learning research from the fields of cognitive science, education, psychology and neuroscience and how this information can be applied to develop learning environments for the health sciences using current and emerging technologies. The focus has been on the process of applying learning theory and pedagogy to produce targeted learning environments for populations in the health sciences, which may include health professionals, technicians/staff, the general public or patients.

The special issue begins with the paper entitled 'An e-learning virtual quality centre for vocational education and training in healthcare management and informatics', by Spyros Kitsiou and Maro Vlachopoulou, which aims to present the main materials, methods and outcomes of the Virtual Quality Centre, an e-learning platform that has been developed within the framework of the Improhealth pilot project. The Improhealth project is funded by the European Leonardo Da Vinci Action Programme, aiming to provide vocational education and training for healthcare professionals and students of health educational programmes in fundamental aspects of modern management and informatics.

The second paper, entitled 'Computer-supported collaborative work systems and communication services in healthcare', by Georgia Lazakidou-Kafetzi, Athina Lazakidou and Konstantinos Siassiakos, presents the next step of our research on empowering the IPOEE-MED collaborative environment. This is a learning environment developed to facilitate the professor's role while providing medical education to medical students through collaborative settings. Here, the authors extend its features in order for it to enrich

the professor-to-student collaboration with real cases as they practise their knowledge in hospital departments. The new learning environment, called 'IPOEE-MED plus' maintains the main features of the initial web-based tool while adding valuable modules and addressing it to a broader usage. It combines both educational and health protective purposes in a cost-effective way. The estimated benefits concern all visible and invisible poles of collaboration as the empowered tool we propose can enrich the learning content as well as the in-time evaluation of learning process. The latter advances a new practice for effective medical treatment by the graduate students while enhancing important theoretical issues of case-based learning.

The third paper, entitled 'A virtual environment in the healthcare domain for the management of clubfoot deformity in newborn babies: a case study', by Manka Lal Jain, Sanjay Govind Dhande and Nalinaksh S. Vyas, gives a novel 3D unilateral clubfoot representation by integrating MRI and medical image processing tools. The methodology is discussed and implemented for better understanding of a human abnormal foot. The work is of interest to the medical community because it provides a computer-aided tool in the form of 3D clubfoot representation. This reduces the number of in-vivo tests by improving the medical diagnosis. The major benefit of this representation is a detailed geometrical visualisation in diagnosis and better treatment of a historical CTEV foot deformity. A future application of this representation is finite element analysis, which will be helpful for biomechanics research on the human foot.

Besides the online communities for people who suffer from diseases, there are also communities for people who want to get rid of bad habits and learn how to develop a new behaviour. The question is how these communities manage to trigger learning. In the fourth paper, entitled 'Learning conversations for people with established bad habits: a study of four health communities', by Åsa Smedberg, a study of the patterns of conversations in four online health communities on bad habits is presented. The study focusses on the usage of counter-acts for learning purposes. The communities showed a relatively low frequency of responses that included opposition and counter-ideas. However, most of the time when these occurred, the community members managed to stay neutral or even to balance opposition with empathy.

The final paper entitled 'Simulation and learning environments in healthcare', by Konstantinos Siassiakos, Stamatia Ilioudi and Athina Lazakidou, presents various learning environments and simulation examples for medical purposes. More than ever, medical students and healthcare professionals are faced with floods of data from which relevant information has to be selected and applied. The internet and the new media are a fertile ground to meet these requirements. More and more physicians embrace e-learning as a new tool and as an attractive adjunct to traditional face-to-face teaching in medicine. Simulation allows significant exploration of multiple options, without spending enormous amounts of money on staff, training, equipment and, most importantly, without risking possible degradation in the level of healthcare. This paper describes the success stories in simulation in healthcare and describes the most important benefits for all parties of the simulation and learning environments in health sciences.

Generally, readers of this special issue will have the opportunity to obtain knowledge and resources to begin designing learning environments that are based on scientific, instructional and technological research findings. I hope researchers will find this issue useful for the development of innovative virtual learning environments in the area of healthcare and in other areas.