PHYSICO-TECHNICAL MEDICINE - TEACHING TECHNICAL SKILLS TO THE PHYSICIAN

Jasmin Seifried, Josef Guttmann, Stefan Schumann
Department of Anesthesiology and Intensive Care Medicine, University Medical Center Freiburg, Freiburg, Germany
jasmin.seifried@uniklinik-freiburg.de

Abstract: The online Master degree program “MasterOnline Physico-Technical Medicine” is an offer of continued medical education for medical professionals. In 2012 the study program was evaluated in a questionnaire. Students of the second semester were comfortable with the workload, the study content, and the medical relevance of the content. Their overall rating of the lectures was very positive.

Keywords: Continued medical education, technology, physics, study program

Introduction
The requirements for physicians in handling medical technology are constantly growing. It appears necessary to acquire technological competences particularly within the fields of medical technology and physics. In the Master degree program “MasterOnline Physico-Technical Medicine (PTM)” such technical authority is conveyed. The study course PTM addresses medical professionals with a professional experience of one year. Including a Master Thesis the entire study program covers 90 Credit Points (ECTS) and leads to the degree „Master of Science“. The targeted workload for a typical student is maximally 10 hours per week.

To cope with the intensive vocational situation of the physician, this study course follows the “Blended-Learning”-concept, i.e. it is conceived as an online study course with small portions of intermittent presence phases. During the online phase, there are usually not more than two courses conducted at the same time.

Within the first year, technical basic skills as ‘measurement technique’, ‘informatics’, and ‘advanced physics’ are covered. Subsequently, two of various advanced courses in different fields of medical technology such as ‘technology in intensive care medicine’, ‘technology in surgery’, ‘technical cardiology’, or ‘radiology’ are selected.

Methods
In a survey, we evaluated the following three lectures, which take place within the second semester: Biosignal Processing, Physics, and Radiophysics. Therefore a questionnaire was distributed among all students, who had passed the second semester (see Figure 1). It included the topics course contents, learning materials, time management, supervision, and overall impression. The students were asked to score their agreement to ‘content is well structured’, ‘content extent is appropriate’ and ‘content is relevant for medical purposes’ on a scale ranging from 1 (fully disagree) to 5 (fully agree). Additionally the students were asked about their weekly workload and their opinion about the workload. Finally they could score their overall-impression about the lectures.

Results
The students participated actively in this study course with highest motivation and large commitment. The students‘ work-load was in the targeted range of about 10 h/week. For the lectures “Biosignal Processing” and “Radiophysics” this workload was stated as “optimal”. On a scale of 1 to 5 content structure was scored with 4.3, content extent with 4.1, and medical relevance with 4.3 (see Figure 2).
Discussion / Conclusion

The study program fulfills the requirements for occupation-accompanying continued medical education. The Blended-Learning-concept offers the possibility to study self-employed accessing text documents, lecture recordings, and electronic lectures and to convert in concentrated presence phases this knowledge into practical exercises. The study program conveys technical skills and enables the students to understand medical technology. Thus it offers new perspectives in working with medical technology. Furthermore it gives impulses for research and development. As reaction on the evaluation we improved and enhanced the study materials and the lecture structure.