Co-operative Blended Learning Biomedical Engineering

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Introduction

Growth of new technologies and demand on higher flexibility and efficiency requires innovative approaches in the field of education of biomedical specialists. Blended Learning is a didactically well-prepared learning situation, communicating a systematically structured theory, which may be partially transmitted through the internet. At this time, there is no such possibility for combining phases of presence with e-learning in Biomedical Engineering in Germany. Teaching material in distance learning is mainly based on lecture video recordings and study documents without higher interaction or automatically generated feedback.

Methods

The new co-operative blended learning concept is being developed under leadership of the TU Dresden team with collaborative university partners in Saxony. They will include specialized components in Biomedical Engineering (biosensors, pacemaker, cardiac catheterization, mechanical ventilation, medical imaging, quality assurance), basics in Engineering Sciences and medicine, and general topics, fitting the recommendations for accreditation. The e-learning software consists of systematically structured theory accompanied by exercises and interactive animations. Each chapter is concluded by a test. Individual user accounts allow detailed user tracking and comprehensive evaluation of e-learning components. The quality assurance process for the first biomedical engineering units is aimed within next months.

Results

Web-based e-learning software components in a specially designed, multi-functional framework can be operated stand-alone as well as integrated into the Web-based Learning Management System OPAL. Six prototype modules have been evaluated. Participants completed both, distant and presence phase. Tools for distance examination procedure had been tested successfully. Ratio between production time and learning time has been 1:250 to 1:300.

Conclusion

Blended learning allows raising qualification of biomedical engineering personal. Quality maintenance is guaranteed by following DIN PAS 1032. Piloting Students appreciated high level of interactivity and assessed work with e-learning software as highly motivating. Especially feedback in exercises and tests was found useful by the students.