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E-Learning in Ophthalmology: An Approach with High Learner Acceptance

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Abstract

For many clinical departments the assessment of technical and financial implications of e-learning is difficult due to lacking knowledge about effective methods in e-learning.

Here, an approach on the basis of pre-existing lecture material is presented: E-learning contents are generated through extending existing lecture presentations with clinical cases and systematic knowledge as well as further interactive elements. In the summer semester 2006 a series of 13 lecture related e-learning modules was made available for training in the University Eye Hospital Freiburg. In the subsequent evaluation students attested a very high acceptance and contentment regarding the given e-learning modules.

Keywords:

e-learning; ophthalmology; evaluation; multimedia

Introduction

E-learning has a variety of properties leading to an steadily increasing demand for its usage in medical education, e.g. the embedding of high quality multimedia or the re-usage of available learning modules Additionally, several studies have shown that learning outcomes of e-learning are at least at equal with traditional methods [1-3]. Despite these considerable needs for e-learning by students and evident successes in education with it, many clinical departments still hesitate to develop or use e-learning for their training. Possible reasons for this include the difficult assessment of both its technical as well as its financial implications for the medical teachers.

Recently, on-the-fly systems for lecture recording and authoring are available to rapidly generate electronically accessible material with comparable low technical and financial barriers [4, 5]. A problem with this approach in the medical field is the frequent presentations of patients in medical lectures. The need to provide protection of the patients' personal rights can only be met by elaborate post-processing (i.e. "cutting") of the recorded lectures.

Here, an approach is presented which is based on pre-existing lecture materials and which allows for the rapid implementation of e-learning modules by clinical departments with low personal and technical resources. Further, medical learners' requirements for an effective training of extensive contents are met by an easy graphical user interface and the avoidance of unnecessary complexity [6].

Figure 2 – Graphical user interface of the e-learning module Glaukom (in German). Learners are encouraged to interactivly participate in a clinical question-answer dialogue. Source materials are Microsoft PowerPoint presentations which are converted to Adobe Flash Format.

Methods

The e-learning modules were introduced for the first time during the summer semester 2006 accompanying the ophthalmology course at the University Hospital Freiburg. The e-learning modules were aimed for the supplementation and deepening of actual lecture and seminar contents as well as the self-assessment of learners.

The didactic concept involved the presentation of multimedia clinical views on signs, symptoms and diseases in combination with systematic ophthalmologic knowledge. Active participation of students in the learning process was achieved by interactive elements. Therefore, existing high qualitative lecture presentations (Microsoft PowerPoint) were enriched with contents on systematic background knowledge, multimedia clinical cases and interactive ele-

ments like questions and exercises. The learners remember cases they know from their lectures by interactively participating in a clinical question-answer-dialogue.

For security and technical reasons the modules were converted to the Adobe Flash Format (ShockWave Flash) by the Articulate Presenter application. This tool generates a hierarchical navigation tree, thumbnails for previewing and a full text index. Multimedia files in the Adobe Flash Media Format can be inserted in the e-learning modules as well. Distribution with personalized access was served by the Learning Management Systems (LMS) of the University Freiburg (CLIX).

Results and discussion

In the summer semester 2006 a series of 13 ophthalmologic lecture related e-learning modules was made available for a total of 167 medical students. The evaluation was performed at the time of the examination of those students with a return rate of 92% (n=153). 85% percent of the students processed all modules; about 66% of the students worked 30 minutes and longer on each module. An interactive approach to the material was chosen by 68% vs. 32% of the learners who preferred a linear script processing mode. The rting (always on a 4-point Lickert Scale) of texts concerning content was in 100% “rather good” and better. The usability was evaluated in over 82% as being “rather good” and better. Concerning the learning benefits of the e-learning modules, 38% of students found them to be “rather beneficial” and even 56% to be “very beneficial”. Over 95% of the students attested to be better prepared for the examination through the e-learning. 92% of learners wanted the e-learning to be further expanded. Of the 153 students in their 2nd or 3rd clinical term, 72% had their first contact with e-learning. The interest in ophthalmology changed from about 64% percent “rather low” and worse to about 90% “rather high” and better during the ophthalmologic education (this effect cannot only be asserted to the e-learning). About 87% percent of students had “rather much fun” or “very much fun” in electronic learning.

The acceptance of the e-learning modules on this large scale was not expected when they were introduced. The clinical curriculum demands a high rate of presence learning after the reformation of medical training in Germany. An average of 8 hour occupation with the e-learning modules is thus a good indicator for the students’ very positive attitude towards the e-learning offer.

Medical training is characterized by a high input of systematic and case-based knowledge. Many complex and high interactive e-learning systems are not very well suited to effectively provide high amounts of knowledge. Possibly, the high acceptance by learners is due to the very effective provision of a substantial amount of knowledge necessary to pass the examination. The technical concept and interactive modalities of this e-learning approach are limited compared to some other e-learning systems [7]. However, the learners who are compelled to master large amounts of contents are highly satisfied with this easy and familiar way of learning.

To summarize, a very positive result in students’ response to this straightforward and very effective e-learning approach in ophthalmology could be detected. The requirements of medical students for electronic training can be met in many cases with both relatively limited technical and financial resources.

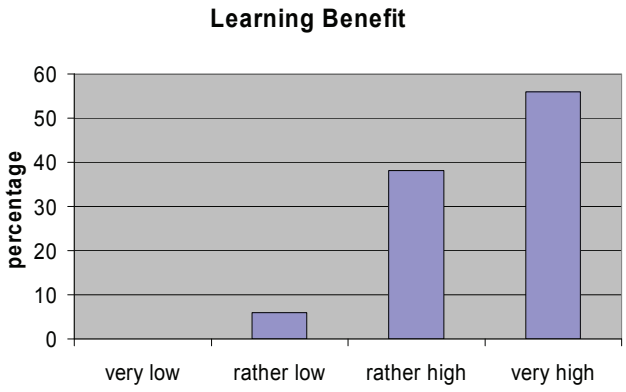

Figure 2 – Self-assessment of the learning benefit due to e-learning (n=152). The overall evaluation results of the e-learning modules were very positive.

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