An electronic guide to physical examination in pre-clerkship medical education: design and pilot.

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Introduction
The physical examination is essential for mastering clinical skills of patient-physician interaction and a crucial part of clinical diagnosis. However, the physical exam skills of new generation of physicians are declining (Ramani, 2008) and innovative approaches to the effective teaching of these procedural skills should be considered. Today’s medical education is shifting rapidly toward e-learning and blended learning where electronic material complement traditional preceptor-led training (Ruiz, 2006). Medical students prefer electronic course material over textbooks for physical diagnosis information in our school. There is currently no concise resource for students to take into the room or at home while they practice physical examination. A lack of standardized resources and variability between examination techniques leaves room for confusion and missing information. Well designed computer-assisted resource proved to be effective capture students attention early in the module, increase engagement with the course material more intently, and in producing lasting clinical skills (Kalet, 2013). We designed an electronic guide to provide clear instructions on technique and standardized relevant material for future reference.

Purpose
The purpose of this project was to design an electronic guide on physical examination techniques standardized for future reference, and to develop and conduct pilot testing of the HEENT exam in the focus group of medical students.

Methods

A well designed e-guide has the potential to positively impact medical education. In particular, design features that allow students to actively manipulate content could yield meaningful gains in clinical learning. This project will give students the opportunity to customize their learning experience by providing the options to use a paper handbook or an e-guide. In the present study we found that medical students appreciate compact and structural presentation of material. The interactivity will potentially demonstrate an impact on knowledge and skills acquisition. These findings are consistent with theories of multimedia learning and adult learning. The e-guide is a simple standardized, easy accessible solution to support self-guided learning. This can improve the efficacy and efficiency of the course and will be tested in future along with improvement of the OSCE scores and student satisfaction (Sonne 2013). Our focus group findings support the use of e-guide to teach physical exam skills. Cognitive load theory suggest that good instructional design minimized extraneous sources of load which can minimized students’ stress in a medical school.

Results
A guide was developed as an interactive PDF with focus on the HEENT (head, eyes, ears, nose, and throat) exam. A common, simple, accurate set of illustrations with appropriate labels and descriptions was developed. The interactive e-guide settings allow students to interact with the information about correct physical exam techniques in a way that was not previously available. The printing handouts feature allow students to physically interact with the material and take additional handwritten notes. Selected illustrations are included as overlays on the photographs so that the anatomy seen in relation to the human body while the correct clinical examination technique is employed. Meanwhile, other illustrations do not include photographic components and solely serve as anatomy references and positional guides for correct technique. The e-guide is designed to be accessible on smart phones, tablets, laptop or desktop computers, which allows students to access this interactive portion anywhere and anytime. In focus group students highly perceived the content and presentation. Students input was very valuable and include suggestions to integrate reporting on normal findings to be used in their write-ups, and to extending the project beyond abdominal, chest, musculoskeletal and neurologic exams as planned to pediatric exam as well.

Students pointed necessity to include glossary targeting first year medical students. In addition, self quizzes will be added to the e-guide to provide instant feedback. Different levels of interactivity was discussed and med-range simple approach found students agreement.

References


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