Chapter 5.9
Tropical Medicine Open Learning Environment[1]

Geraldine Clarebout
University of Leuven, Belgium

Jan Elen
University of Leuven, Belgium

Joost Lowyck
University of Leuven, Belgium

Jef Van den Ende
Institute for Tropical Medicine, Belgium

Erwin Van den Enden
Institute for Tropical Medicine, Belgium

INTRODUCTION

Educational goals have generally shifted from knowing everything in a specific domain to knowing how to deal with complex problems. Reasoning and information-processing skills have become more important than the sheer amount of information memorized. In medical education, the same evolution has occurred. Diagnostic reasoning processes get more strongly emphasized. Whereas previously knowing all symptoms and diseases was stressed, reasoning skills have now become educationally more important. They must enable professionals to distinguish between differential diagnoses and to recognize patterns of illnesses (e.g., Myers & Dorsey, 1994).

BACKGROUND

Authentic or realistic tasks have been advocated to foster the acquisition of complex problem-solving processes (Jacobson & Spiro, 1995; Jonassen, 1997). In medical education, this has led to the use of expert systems. Such systems were initially developed to assist practitioners in their practice (NEOMYCIN, in Cormie, 1988; PATHMASTER in Frohlich, Miller & Morrow, 1990; LIED in Console, Molino, Ripa di Meana & Torasso, 1992) and simulate real situations. These systems were expected to provoke or develop students' diagnostic reasoning processes. However, the implementation of such expert systems in regular educational settings has not been successful.

Copyright © 2009, IGI Global, distributing in print or electronic forms without written permission of IGI Global is prohibited.

Instead of developing reasoning processes, these systems assume them to be available. They focus on quickly getting to a solution rather than reflecting on possible alternatives. Consequently, it was concluded that students need more guidance in the development of diagnostic reasoning skills (Console et al., 1992, Cromie, 1988; Friedman, France & Drossman, 1991), and that instructional support was lacking.

KABISA is one of the computer programs purposely designed to help students in the development of their diagnostic reasoning skills (Van den Ende, Blot, Kesten, Van Gompel & Van den Enden, 1997). It is a dedicated computer-based training program for acquiring and optimizing diagnostic reasoning skills in tropical medicine.

DESCRIPTION OF THE PROGRAM[2]

KABISA confronts the user with cases, or 'virtual patients'. The virtual patient is initially presented by three 'characteristics'[3] randomly selected by the program. After the presentation of the patient (three characteristics), students can ask for additional characteristics gathered through anamnesis, physical examination, laboratory and imaging. If students click on a particular characteristic, such as a physical examination test, they receive feedback. Students are informed about the presence of a certain disease characteristic, or whether a test is positive or negative. If students ask a 'non-considered' characteristic; that is, a characteristic that is not relevant or useful in relation to the virtual patient, they are informed of this and asked whether they want to reveal the diagnosis they were thinking about. When they do so, students receive an overview of the characteristics that were explained by their selection and which ones are not, as well as the place of the selected diagnosis on a list that ranks diagnoses according to their probability given the characteristics at hand. If students do not want to show the diagnosis they were thinking about they can just continue asking for characteristics. A session is ended with students giving a final diagnosis. KABISA informs them about the correctness. If the diagnosis is correct, students are congratulated. If the diagnosis is not correct, students may be informed that it is a very plausible diagnosis but that they do not have enough evidence, or they may get a ranking of their diagnosis and an overview of the disease characteristics that can and cannot be explained by their answer. Additionally, different non-embedded support devices – that is, tools are made available to support learners. These tools allow students to look for information about certain symptoms or diseases, to compare different diagnoses or to see how much a certain characteristic contributes to the certainty for a specific diagnosis. Students decide when and how they use these devices (for a more detailed description, see Clarebout, Elen, Lowyck, Van den Ende & Van den Enden, 2004).

FUTURE TRENDS AND CRITICAL ISSUES

KABISA is designed as an open learning environment (Hannafin, Hall, Land & Hill, 1994); that is, students are confronted with a realistic and authentic problem, there is a large amount of learner control and tools are provided to guide students' learning. However, the evaluation study performed revealed some interesting issues. A first revelation was that students do not follow a criterion path when working on KABISA. Prior to the evaluation, two domain experts in collaboration with three instructional designers constructed a criterion path. This path represented the ideal paths students should go through to optimally benefit from KABISA (following the "normative approach" of Elstein & Rabinowitz, 1993), including when to use a specific tool. Only 5 out of 44 students followed this path.

A second issue relates to the use of the tools. KABISA offers different tools to support

4 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/tropical-medicine-open-learning-environment/26310

Related Content

EEG Based Thought Translator: A BCI Model for Paraplegic Patients
N. Sriraam (2013). *International Journal of Biomedical and Clinical Engineering (pp. 50-62).*
www.irma-international.org/article/eeg-based-thought-translator/96828

Classification of Breast Thermograms Using Statistical Moments and Entropy Features with Probabilistic Neural Networks
Natarajan Sriraam, Leema Murali, Amoolya Girish, Manjunath Sirur, Sushmitha Srinivas, Prabha Ravi, B. Venkataraman, M. Menaka, A. Shenbagavalliand Josephine Jeyanathan (2017). *International Journal of Biomedical and Clinical Engineering (pp. 18-32).*
www.irma-international.org/article/classification-of-breast-thermograms-using-statistical-moments-and-entropy-features-with-probabilistic-neural-networks/189118

Statistical Based Analysis of Electrooculogram (EOG) Signals: A Pilot Study
Sandra D'Souzaand N. Sriraam (2013). *International Journal of Biomedical and Clinical Engineering (pp. 12-25).*
www.irma-international.org/article/statistical-based-analysis-of-electrooculogram-eog-signals/96825

Modelling and Simulation of Biological Systems
George I. Mihalas (2006). *Handbook of Research on Informatics in Healthcare and Biomedicine (pp. 68-73).*
www.irma-international.org/chapter/modelling-simulation-biological-systems/20564

Intelligent Models to Predict the Prognosis of Premature Neonates According to Their EEG Signals
Yasser Al Hajjar, Abd El Salam Ahmad Al Hajjar, Bassam Dayaand Pierre Chauvet (2017). *International Journal of Biomedical and Clinical Engineering (pp. 57-66).*
www.irma-international.org/article/intelligent-models-to-predict-the-prognosis-of-premature-neonates-according-to-their-eeg-signals/185624