

Design of a Knowledge Acquisition Tool using A Constructivist Approach for Creating Tailorable Patient Education Materials

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Research in patient education suggests that tailored health educational materials can improve patients' understanding of their treatment plan and help to achieve patient engagement and compliance. The goal of the HealthDoc Project has been the creation of automated Natural Language Generation systems for producing educational materials that are tailored to an individual patient's medical condition and personal situation. The project has so far focused on developing computational linguistic tools needed to author tailorable content from which customized versions could be generated. Since the project assumed that there are already discourse structures existed for tailored educational materials, a new approach is needed to construct these structures and ensure that the relevant medical knowledge will be captured and delivered to the patient by assisting the health professionals in directly authoring the required domain knowledge.

We have used constructivist educational theory and knowledge-level modelling to define a new approach incorporating Patient-Centric and Behaviour-Modifying Educational Model (PBEM) and a knowledge acquisition framework. Unlike traditional approaches, in which all patients are treated alike in terms of the medical information provided, our new model takes into account characteristics of individual patients. This facilitates the patient's assimilation of relevant information pertaining to their behaviour and health. As the information provided must address the various concerns of different stakeholders, and different patients have different concerns and concern intensities, a knowledge acquisition framework was developed to provide a structure for patient knowledge acquisition. This framework includes the following components: a Strategic Model, a Concerns Model, and an Interrogation-based knowledge acquisition tool. The tool is intended to be used directly by health professionals and to assist them in formulating, structuring, representing, and articulating their domain knowledge. This research work explores a new field, *knowledge-level modelling*, for generating patient-tailored education materials and provides guidelines to implementing such a knowledge acquisition tool.