USE OF CONCEPT MAPS IN BIOMEDICAL ENGINEERING EDUCATION

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Abstract: We describe a tool which allows the students to create concept maps to be used to present information in a hierarchically structured manner. This is applied to biomedical engineering studies.

Introduction

Biomedical engineering consists of a large number of interrelated ideas and concepts. These concepts form a complex matrix of information, which is often too vast to comprehend. To enable students to better understand interactions of different topics it is necessary to restructure the information into a more understandable form.

One of such knowledge representation methods is called concept mapping. Concept maps can be used to present information in a hierarchically structured manner. The goal of this study was develop a tool which would allow students and teachers to create concept maps related to biomedical engineering in collaboration with each others.

Materials and Methods

Concept mapping is a knowledge representation tool, where information is presented as a hierarchical matrix of conceptually connected nodes. These nodes are called concepts and their connections relations. When concepts are linked together by relations they form propositions. Propositions should be formed so that they could be read as comprehensible sentences. An example of a concept map is shown in Figure 1.

Because the aim of concept mapping is to depict a complete overall picture of a certain topic, maps should go through several iterations of editing. In a field as wide as biomedical engineering overall comprehension of topics is usually better if a group of people collaborate in the concept mapping process. To aid such collaboration an application to create and edit concept maps was developed.

Due to the multitude of different topics and their interrelations, an effort to include all concepts relevant to biomedical engineering in a single concept map would result in a very large-scale and rather incomprehensible diagram. It is more suitable to break down such a super-map into several interconnected sub-maps, thus creating a conceptual network on biomedical engineering. [1]

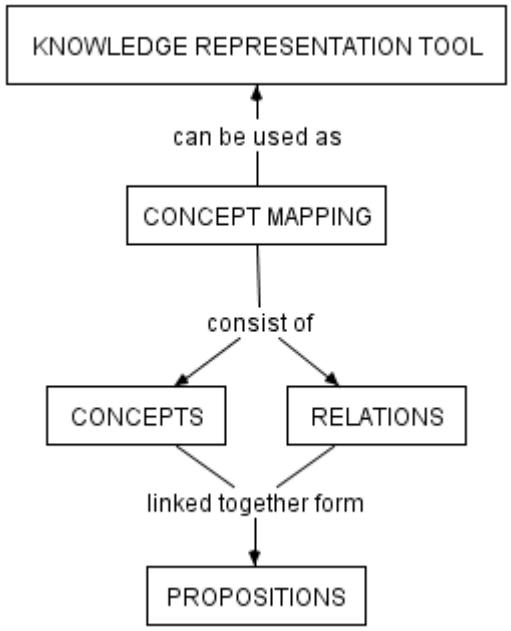

Figure 1: A concept map about concept mapping

Results

To ensure widespread access the concept mapping tool was designed to be a Web application. This way the only technical requirement for the contributors is an access to a Web browser. The design of the application is based on a Wiki engine, which provides an automatically managed method to create a network of linked concept maps. The engine also allows every participant to edit an existing map. Drawing of the graphical diagram itself is done with an applet, which is embedded in the pages used for editing the content. [2]

Conclusions

Concept mapping is a useful tool for representing knowledge in a hierarchically structured form. Most beneficial use of concepts maps involves a group of students creating and editing a map in collaboration with each other. Formulation of long-term, course-wide maps will be used as project assignments on forthcoming courses provided by Ragnar Granit institute. Future emphasis is placed on developing guidelines on the use of concept maps for the teachers and encouraging students to employ concept mapping techniques in their daily studies.

References

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