Work in Progress: Multicultural Concept Map Editor

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Abstract. This paper presents a project that aims to develop a collaborative Concept Map Editor that will provide the necessary functionality to be used by multicultural teams.

1 Introduction

Internationalization and globalization have become familiar terms in current developed societies. The political, economic, cultural, and social changes caused by globalization have made an impact on society especially with the incorporation of Information and Communication Technologies (ICTs). Government strategies focus their attention on ensuring citizens equal opportunities to use ICTs. But ICTs should be prepared also to support cultural diversity. Possibly the single biggest factor that global teams need to address is cultural difference [5]. It is imperative to ICTs that encourage mutual understanding and bridge the difference in cultures [3]. But when developing such tools, it is also important to maintain some of the differentiation allowed by modern information technology to preserve such differences [6].

Since Novak [4] placed concept mapping on the educational agenda, it has become an increasingly popular advanced teaching and learning tool. The fundamentals of concept mapping are in Ausubel's learning theory [1]. A Concept Map (CM) is a graphical way of representing and organising knowledge. It is comprised of nodes and links, arranged in some order to reflect the domain information being represented. Nodes symbolize concepts, and links represent relationship between concepts.

This paper presents the functionality that has been included in a collaborative Concept Map editor to allow multicultural concept mapping.

2 Identifying functionality for multicultural concept mapping

In [2], a survey-based cross-cultural study was presented. The objectives of the study were the identification of the requirements for concept mapping editors when considering multicultural issues. Eleven university students from seven countries participated in the experiment. Participants of the experiment were asked to use a Concept Map editor to adapt a base CM to their culture and afterwards to complete a survey. From the analysis of the resulting CMs and the responses to the questionnaire, some conclusions were drawn.

Language was found an essential factor when working with multicultural issues. Participants thought that language tools such as dictionaries, translators, spellers, thesauri, should be integrated in a multicultural Concept Map editor. Images and colours were identified as important factors. Finally, spatial distribution of the CM elements was not considered relevant when adapting the CM.

3 From a multilingual CM Editor to a multicultural one

Elkar-CM (Arellano et al., 2006) is a multilingual collaborative CM editor that allows synchronous collaboration based on token-passing. Elkar-CM has been designed following the internationalization-localization guidelines. The tool can be localized not only at interface level but also regarding the final CMs it generates. With this feature multicultural CMs can be drawn using the view mechanism. A CM can have different views, one for each culture. All the views share the same structure, i.e. the same nodes and relationships. However, each view can have its own way of representing nodes and relationships, labels, images, etc. In addition, Elkar-CM provides a chat that is synchronised with the actions performed by the users.

Considering the results of the study mentioned above, some new functionality is being added to Elkar-CM to improve the tools offered to support multilingualism and other mechanisms to allow multicultural concept mapping:

Dictionary: a set of on-line dictionaries has been already included in Elkar-CM. It includes defining dictionaries, bilingual dictionaries for different languages and thesauri. Elkar-CM also provides local dictionaries to improve efficiency: a general dictionary, dictionaries attached to a CM and multilingual dictionaries. It is planned to implement a dictionary adapted to each user.

Translator: the translation functionality has been added. Manual translation is based on the used of multilingual dictionaries and automatic translation uses on-line translators. Thus, CM labels and chat interventions can be translated.

Speller: it is programmed to include spellers for different languages.

Multimedia management: multimedia files attached to the nodes and relations can be localized to different cultures.

Transformation rules: when clear correspondences are found between visual characteristics in different cultures (e.g. colour) transformation rules could be defined to help in the adaption of the CM to other cultures. A simple transformation mechanism has been implemented but it has to be improved.

Elkar-CM will be tested with multicultural teams composed of people from close cultures and more diverse teams.

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References

1. Ausubel, D.P.: Educational Psychology; A cognitive View. N.Y.: Holt, Rinehart and Winston (1968).
2. Calvo, I., Arruarte, A., Elorriaga, J.A., Larrañaga, M., McCalla, G.: Identifying Meaningful Concept Map Elements from a Cultural Perspective. IEEE 13th Int. Conf. on Advanced Learning Technologies, IEEE Computer Society, pp. 250-252 (2013).
3. Hachimura, K., Ishida, T., Tosa, N.: Proceedings of the Second International Conference on Culture and Computing, IEEE Computer Society (2011).
4. Novak, J.D.: A theory of education. Cornell University, Ithaca, NY. (1977)
5. Olson, G.M., Olson, J.S.: Distance Matters. Human Computer Interaction,15(2),139-178 (2000).
6. Van Alstyne, M. & Brynjolfsson, D.: Widening Access and Narrowing Focus: Could the Internet Balkanize Science? Science, 274, 1479-1480 (1996).