Statistical Analysis For Hipermedia Courseware Quality Evaluation

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Nowadays we find in the market low quality and useful educational multimedia software products. These products don't respond to the initial expectations, fundamentally for three reasons: 1) the quick development of new technologies of information; 2) the lack of a specific methodology with a rigorously scientific theoretical and practical base and 3) the difficulty to define and to quantify the characteristics of quality.

When the multimedia technology is applied to the Computing Assisted Teaching the Multimedia Courseware is obtained. Now then, if it is possible that the program shows its content by means of a structure of connected elements, through which the user can move, then Hipermedia Courseware is achieved.

The form of acquiring the information of this kind of programs, and the way in which is allowed the user to move trough them compose the Navigation Structure.

The Hipermedia Courseware should provide an appropriated navigation structure to obtain a satisfactory interaction between the student and the hipermedia product. Thus, the program should provide a suitable navigation structure in order to avoid situations such as "lost in the hyperespace", the difficulty of extracting the desired information by the student, ineffective searches….

For that, we suggest the use of the Conceptual Map as suitable navigation structure. This way, the Map can also be used as synthetic visual representation of the program in its group, allowing the student to identify easily which their parts and their interrrelaciones are.

In the didactic field many authors use the conceptual map as an essential tool for outlines construction.

This paper describes an evaluation methodology of the effectiveness of the navigation structures for hipermedia courseware. Additionally, the work shows how the outlines tool, as the conceptual map, utilisation increases the navigation goodness throughput.

The methodology is based on not parametric statistical techniques applied to the use of an hipermedia courseware about Spain and its culture (Cultura'95).

For that, an experiment has been designed. It has been worked with a sample of 16 foreign students randomly chosen. The students belong to the Erasmus Project and all them were studying Spanish in Valencia.

The response variable to analyse has been the Significant Navigation ratio, defined as the Number of Significant Jumps divided by the Total Number of Jumps. This ratio pretends quantify a quality characteristic of goodness navigation.

The times and events about the use of the program, necessaries to calculate the ratio, have been picked up by means of a software monitor implemented inside the same program.

The navigation structure to evaluate has been the conceptual map, therefore, in our case, we have:

Ho: The conceptual map as navigation structure doesn't affect to the goodness of this one.

H1: the existence of the map conceptual improves the navigation.

To validate the hypothesis the Test of Wilcoxon has been used. The non parametric tests have been considered appropriated by the lack of bibliography support, the novel character of the field and the small size of the sample, among other reasons.

A design of two matched groups has been chosen following some approaches based on the information provided by the students by means of a survey filled before the experiment. A group has used Cultura'95 with conceptual map, and the other one without this, but with an added sequential navigation structure. The match criterions have been the student's computer knowledge and the knowledge level of the Spanish language. All students in both groups have been asked to manage Cultura'95 for 30 minutes.

The results of the experiment, in both groups, have shown that the presence of the conceptual map, as navigation structure, increases the navigation goodness throughput.

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FRENCH RÉSUMÉ

Ce travail décrit une méthode pour évaluer la qualité du software Multimedia éducatif, qui se base sur des téchniques statistiques non paramétriques. Par la suite, la méthode s'applique pour évaluer l'efficacité de la structure de navigation d'un programme Hipermedia éducatif (Cultura'95)

L'évaluation se réalise à travers l'analyse statistique des résultats de l'utilisation du programme aprés avoir fait un prélèvement d'usagers

Les résultats sont temps d'interaction usager-programme capturés à travers un monitor software trasparent á l'usager et spécialment programmé pour cette méthode.