

we obtained some results to be applied in the elaboration of “good practices” about online teaching and learning specific contents in Physics. An itinerary for converting a linear text to hypertext and some rules for the design of web pages for Physics courses will be presented in the conference. An example of itinerary to transform a linear course about energy for secondary school students into hypertext material will also be shown.

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Jonassen, D. (1986). «Hypertext Principles for Text and Courseware Design.» *Educational Psychologist* 21(4): 269-292.

Troffer, A. (2001). «*Writing Effectively Online: How to Compose Hypertext*», from <http://homepage.mac.com/alysson/httoc.html>

## Redesigning a hypertextual course about Acoustics

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When one decides to design on-line educational materials, he have to bear in mind multiple dimensions, such as the non-linearity of the hypertext, the use of embedded multimedia languages and the interactivity between learners and educational tools. The Internet and the Information and Communication Technologies provide a challenge to develop all these dimensions in order to enhance web-based learning. The AFINET project (Learning of Physics through the Internet) is intended to know which transformations of a classic linear text on Physics education need to be done to develop hypertextual materials.

This type of transformations have been applied to some educational material about Acoustics, taking into account the synergy and coordination between a Physics Education research group and another one expert at designing web-pages.

- Firstly, these transformations are based on the nature of the selected topic. That's why we began analyzing the interrelations between ideas and concepts on Acoustics, in order to propose a hierarchical organisation of concepts. This organisation is represented by a conceptual map and it is intended to substitute the classical way to show the contents by means of a content table. Some of the associated problems will be presented.

- On the other hand, some of the proposed transformations are related to the pedagogical approach intended for the online educational material. For instance, the linking propositions among topics were rephrased as questions in order to provide students with more meaningful links between ideas. We will show the discussion about these questions, which have been designed to allow students a deeper understanding of their navigation.

The main students' reactions to an online course on Acoustics, which is not designed according to an index model but to a concept map model and which is not sequenced so that any student can choose a different navigation way, will be presented.

1. Bransford, J., Brown, L., Cocking, R., *How people learn. Brain, Mind, Experience, and School*. 1999, Washington.
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4. Salmerón, L., Baccino, T., Cañas, J., Madrid, R., Fajardo, I., *Do graphical overviews facilitate or hinder comprehension in hypertext?* Computers & Education, 2009. 53: p. 1308-1319.

## **Augmented Reality Games in high-school education.**

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The anticipated lack of science-educated people has been exposed in newspaper headlines, TV-discussion programs and more elaborated sources as a European Commission-report (EU, 2004) entitled "Europe needs more scientists". It reports of the falling recruitment of students in science at upper secondary and higher levels. The report holds all parts of the education system responsible for young people's lack of interest in science and thereby not choosing a career in a science-related area. The same tendencies are noted in the US (National Academy of Sciences 2006; NCEE 2007; PKAL 2007a; US NSB 2007). Result from the ROSE-project (Schreiner&Sjöberg, 2006) indicate that although both boys and girls in developed countries think that science and technology are important for society only some boys and very few of the girls can see themselves working with S&T related jobs. In *Science Education NOW* (EU, 2007) and *Science Education in Europe: Critical Reflections* (Dillon & Osborne, 2008) the authors targets the way science is taught as the main factor behind the declining interest in science studies. They criticize the pedagogy in school science and claim that it is dominated by a conduit metaphor where knowledge is transferred to the students without any discussion. Research shows that this static way of work is one reason why students, and particularly female students, choose to leave science subjects when they can.