MPTL14 2009
Udine 23-25 September 2009 Poster 3 pages (top 9000 characters). Track 7 - 38

# MULTIMEDIA IN TEACHING: AN EVALUATION TOOL

**Rodríguez – Cifuentes Ma. Trinidad,** *Educational Technology Research Group, University of Murcia, SPAIN*
**Amorós – Poveda Lucía,** *Approach of Education Department - Collaborator, Catholic University of Maule, CHILE*
**Fernández – López Luisa Ma,** *On-line Training and Resources Teaching High Institute (ISFTIC), SPAIN*
**Zamarro – Minguel José M,** *CoLos Member, Univeristy of Murcia, SPAIN*

## Abstract
Description about a pedagogic evaluation, thinking in multimedia resources applied to teaching. This questionnaire has been elaborated by the Group of Research about Educational Technology (GITE) at the University of Murcia, in Spain. Questionnaire has been used by this group in past researches like SUPERCOMET 2 project, to improve and to teach physics. This tool is available in English, actually.

## 1. Multimedia in Teaching Sciences
Starting with the Superconductivity laboratory online (1998-2001), the SUPERCOMET project has its roots in a project called Superlab, which had as its main goal the illustration of superconductivity in an easy and understandable way. The project was initiated by Professor Kristian Fossheim at the Department of Physics at the Norwegian University of Science and Technology (NTNU) in Trondheim. Professor Fossheim specializes in research on superconducting materials, and has also participated for many years in the public debate regarding research politics in Norway (SUPERCOMET_superlab, 2008).

A university's foremost tasks are these: education, research and science communication. The last of these three tasks have a tendency to take a back seat compared to the former two. Professor Fossheim has always taken a keen interest in communicating scientific knowledge. In the last decade or so, new computer technology has made it possible to visualize concepts in physics and superconductivity and thus communicating them to a far broader audience. Professor Fossheim's deeper motivation for the Superlab project was to reach out to young people, especially high school students, with the message that science and technology is exciting, fascinating, important and useful. Aims and topics of SUPERCOMET are available in http://www.simplicatus.no/web.php?action=subpagelevel2_view_single&pk=42

*Figure 1: Hands-on experiments with students of Secondary schools. February 2008*

Multimedia design and multimedia computer systems are now everywhere. Basic aspect of multimediality is its *hypertexuality* which, essentially, means the use of various media texts in tandem. De Kerckhove (1997) describes hypertextuality as a means for tracking and storing interconnected information, through the establishment of nodes and links between one type of information (say verbal) and another (say visual). The concept of multimedia is, thus, refined to mean interconnectivity among modes of information stored in specific ways.

Electric conduction module was used. An exercise book was prepared, which students had to carry out while they were using the SUPERCOMET materials. The teaching process lasted five class sessions. Learning process was as autonomous as possible, so that students could carry out the exercises based on observation and manipulation of the animations and text in the materials. From time to time the teacher provided additional information that could not be extracted from the slides or he/she explained some concepts when asked by the pupils. During four weeks up to five hundred students from 24 schools comes to the University for Hands-on Experiments. One session is dedicated to perform low-tech and high-tech SUPERCOMET experiences introducing basic aspect of electromagnetism and superconductors (Figure 1). Several questionnaires and tools were used. They can be revised in Amorós (2004). Since the instruments were already validated it was unnecessary to validate the questionnaires. In next pages we show an example questionnaire. In this case the "educational multimedia evaluation form" was used thinking in the assessment of multimedia tools to teaching-learning process.

Cabero (1994, 1999) attends about evaluation of media. Gellevij, Hans, Jong and Pieters (2002) studies to computers Sim Quest and motion applications and manuals. To coding and scoring they attend to: number of participant in the analyses, computer experience, age, gender, topic of study and grade level, cognitive load, training time on manual chapters, verification and learning effects.

### *1.1. An evaluation tool*

McLuhan Program in Culture and Technology (MPCT, University of Toronto, Canada) shows about background of this questionnaire and the use in educational contexts in http://www.utoronto.ca/mcluhan/luciaamorospoveda.htm). The use inside SUPERCOMET project can be seen in SIMPLICATUS, ANNEXES (third link, pages 38 – 49) available in http://supercomet.no/gb/SUPERCOMET-2/Results

Questionnaire applied the interview, following Cook and Reichardt (1982), and Walker (1985). They recognizes interview explain our conducts on the reflection of our actions. Questionnaire is considered like a formal, streamlined interview. Formally, it is similar to an interview face to face, but questionnaire is done without the presence of the researcher. Between these advantages it emphasizes that potentially it implies an identical stimulus to numerous subjects. Disadvantages have to do with the production of data in mass and the lack of interpretation opportunities.

Questionnaire used Likert scale valuation, between others. Internal items took like departure points the objectives and topics to the project. Likert scale measures attitudes and is the most popular model and intuitive (Rojas et. al, 1998). Degree in agreement or discord with the statement is asked for to the subject. The obtained score informs into the position of the interviewed one with respect to the study object. Prendes (1994) indicates that the objects are used with the purpose of generating data in the subjects, improving scale-information. Scale has different number of answer options. Usually five categories have been used (table 1).

*Table 1: Categories applied in this tool, by Likert scale*

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Nothing | Fairly | Normal | Enough | Much |

More examples about a qualitative scale are available in Table 2 and 3. They are researching about two different topics inside a multimedia "Attention" and "Creativity". Multimedia evaluation attends students and the attention kept when they use a multimedia resource. Table 2 shows 4

items with attention of the user, like “Multimedia keeps the attention related to the content”. “Creativity” is studied in table 3 with 7 items about it. Table 3 attends factors contributing to its development. Tables are using 4 categories: Nothing, Little, Quite a lot and A lot.

*Table 2: Topic “attention”*

| **It keeps the attention:** | **Nothing** | **Little** | **Quite a lot** | **A lot** |
|---|---|---|---|---|
| Related to the content | | | | |
| Related to the design | | | | |
| Because of the technical quality | | | | |
| Others | | | | |

*Table 3: Topic “creativity”*

| **Factors contributing to its development:** | **Nothing** | **Little** | **Quite a lot** | **A lot** |
|---|---|---|---|---|
| Promotes over-learning and self discipline | | | | |
| Stimulates creative and divergent processes | | | | |
| Free associations between given information | | | | |
| Proposes solutions to problems | | | | |
| Sets up open tasks | | | | |
| Surprise and originality | | | | |
| Help in order to learn from mistakes | | | | |

## References


Amoros, L. (2004). *Evaluacion de hypermedia en la ense*ñanza. Murcia: University of Murcia. Doctoral Thesis. Not published.

Cook, T.D. and Reichardt, CH. S. (2000)[1982]. *Métodos cualitativos y cuantitativos en investigación evaluativa.* (4a. ed.). Madrid: Morata. *Cualitative and Quantitative Methods in evaluation research.* n.l. Sage Publications.

Kerckhove, D. de. (1997). *Inteligencias en conexión.* Barcelona: Gedisa. *Connected intelligence. The arrival of the web society*. Somerville House Books Limited.

Engstrøm, V. (2009). E-Mail 18 may 2009. Subject: SUPERCOMET 2 – access supercomet@simplicatus.no

Gellevij, M.; Meij, H. Van Der; Jong, T. De and Pieters, J. (2002). “Multimodal Versus Unimodal Instruction in a Complex Learning Context”. *The Journal of Experimental Education*, 70 (3), 215-239.

Prendes, Ma. P. (1994): *La imagen didáctica: análisis descriptivo y evaluativo*. Murcia: University of Murcia. Doctoral Thesis. Not published.

Rojas, A.J.; Fernandez, J.S. and Perez, C. (1998). *Investigar mediante encuestas: fundamentos teóricos y aspectos prácticos*. Madrid, Síntesis.

SIMPLICATUS AS. (2006-2008). SUPERCOMET Project Family.
Available in http://supercomet.no/gb/SUPERCOMET-2/Results
Link: SC2_evaluation_report_ANNEXES_20071214_HGM.pdf [19/05/2009]

SUPERCOMET-Superlab. (2006-2008). Superlab.http://supercomet.no/gb/Superlab [23/05/2009]

Walker, R. (2002). [1989]. *Métodos de investigación para el profesorado. Técnicas de evaluación*. [3º ed.]. Morata: Madrid. Doing Research. A Handbook for teachers. (1985). London: Methuen & Co.Ltd.


## Credits

Photo 1: SUPERCOMET, University of Murcia. Available in
http://supercomet.no/gb/Partners/Spain/University-of-Murcia

## Acknowledgements


Cheshire Newbridge Respite Center and Jarlath Tunney (Cheshire Fundation, Ireland). Professor Marcel Danesi (University of Toronto, Canada).