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A CASE FOR LEARNING SITES WITH VIDEO BYTES: THE HYPERSCAPES EXPERIENCE

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The Problem

Hypermedia and multimedia have been placed rather uncritically at the centre of current developments in learning technology. A striking observation is that the best learning experience is enjoyed by hypermedia courseware authors rather than students. This is understandable from the mainstream constructivist view of the learning process, in which the key aim is to engage the learner in carrying out a task that leads to better comprehension.

Mainstream research on educational technology has focused on the discovery of more effective ways for conveying “relevant” information to students. A problem that we identified is that students often do not engage with the subject matter, especially when dealing with complex domain representations, even when hypermedia resources are available. With the emergence of massive information resources there is a need for powerful and effective learning tools that can handle all kinds of media configurations.

We believe that more attention has to be paid to the relationship between motivational and cognitive issues. We propose a new model for online interaction that deals with the fractal structuring of knowledge in online learning environments. We argue that cognitive mapping can provide the right support for visualization and navigation of complex hypermedia structures. According to Jonassen (1989), hypermedia representations may correspond with the mental associative knowledge representation in the mental reference models of the learner. Developing new hyperlinks stimulates the extension of the learner’s mental reference models, assuming that new information, when learned, is integrated with prior knowledge using a web structure rather than a linear structure.

Research Approach

A group of 17 students, attending a course on *video* as part of a MEd programme on *Educational Multimedia*, was given the task of creating **fractal hyperscapes** i.e. mapping and developing layered Web structures reflecting their interaction with knowledge, instructors and colleagues. The aim of our research was to find out how the learning process evolves when a group of students works together as architects of conceptual hyperspaces. The emphasis was put on the levels of engagement and motivation attained and the final quality of the hyperscapes material, as compared with traditional classroom learning. Tools used for observation were video recordings, screen capture records and conference logs.

According to Tony Buzan (1995) a **mind map** consists of a central word or concept, around which 5 to 10 main related ideas are drawn. Each of those related concepts could be associated with descendant concepts. Images and graphics may be added to this representation. Fractal hyperscapes rely on mind maps that represent the knowledge, objectives and strategies used for learning. These may be used for several purposes: generate ideas, design complex structures, communicate complex ideas, aid learning by explicitly integrating new and old knowledge, and assess understanding or diagnose misunderstanding. We have used MindManager™ software in this experiment to design knowledge structures and create Web pages from the mind maps developed.

The approach was straightforward: conditions were set for small groups to work collaboratively, online and offline, with the aim of developing hyperscapes on a given subject/theme. The tools and technology used included: e-mail, conferencing (Netmeeting, BSCW) and video. Because of the fractal nature of hyperscapes students could “join in” at specific times to extend and develop further “scapes” thus creating tree-like structures that represented the domain knowledge. The end result was the production of a Web site based on the final project map (fig. 1).

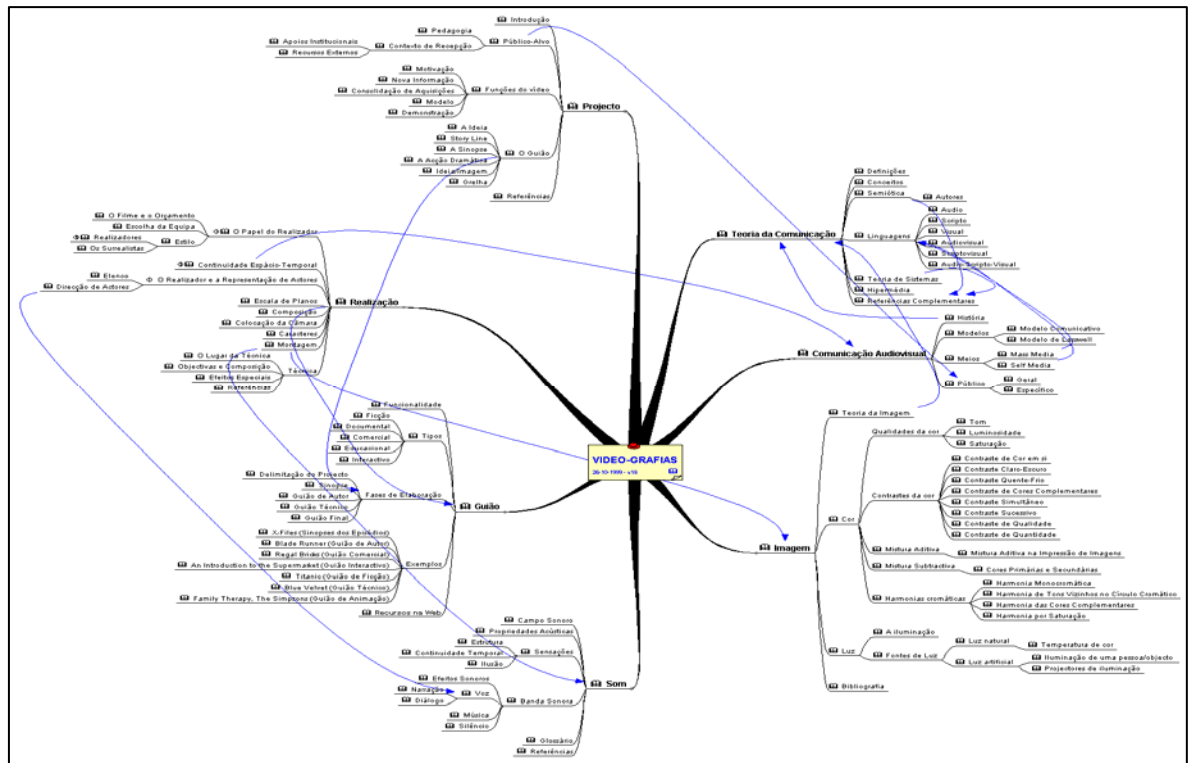


Figure 1

Experimentation Framework

We have tested a new model for online/offline interaction, dealing with the fractal structuring of knowledge in Web based environments. The **Fractal Hyperscapes Model** is both a mechanism to bring expressive power to authors and a tool to support learners in finding paths relevant to their own aims and needs. It relies on cognitive mapping to provide the right support for visualization and navigation of complex hypermedia structures. **Visualization** is an important aspect of this process as learners attempt to mind map the structure of knowledge they acquire (Zeiliger, 1995). Mind mapping tools have been available for sometime now but only recently do they support the creation of hypermaps that can be converted to Web environments.

The interaction environment for this course was based on the following matrix:

	Same time	Different time
Same space	Enhanced classroom (Web+video)	Offline facilities (MindManager)
Different space	Videoconference and chat (Netmeeting)	Online facilities (BSCW, E-mail)

Video was used to enhance the students' engagement in the initial stages and to involve each individual learner in novel and interesting ways. Rather than just trying to simulate existing reality on the screen, to create a "virtual reality", we found that it is possible to create a new experience for the viewer with simple means. In the past, microworlds have been created with multimedia to provide an entirely new framework for the learner to explore, but today, the Web can already provide plenty of "worlds" to interact with. According to Spiro and Jengh (1990), learners are able to spontaneously restructure their knowledge in many ways as they chart their courses through the hypermedia material.

Learner variables are often neglected in the development of multimedia systems for education. It is quite common to find the emphasis on the multimedia technology itself. In our view, a learning system must address the issue of different individual learning abilities. In fact, cognitive representations may vary so widely that a single system will not be able to cope with the variation. We provided for differences in the learning context, both in terms of behaviour and in preferences for some representations over others (e.g., visual vs. textual), but this must be tempered by the tasks given and the learning outcomes required. The construction of a hypermedia learning resource must be treated as the design of a **cognitive artefact** that fully matches the learning objectives if it is to have more than mere entertainment value.

A Light on the Conclusions

The preliminary findings suggest that this model is effective to motivate students and increase the level of interaction with the learning resources. We were able to witness that play and experimentation are powerful forces in the development of the individual mind

and that motivational gains are made when learners work together in a collaborative way, both online and offline. The students saw the activities as highly motivating but guidance was often necessary. The experience shows that mind mapping and the construction of hyperscapes require some degree of assistance from the tutor (to facilitate and coordinate).

The evidence proves that offering the contents on the Internet is not enough; indeed, learners must not only reach information, they must be able to treat it and reorganize it. To describe an environment as constructivist it is necessary to make it possible for the user to add to it his comprehension and annotation on the original material. However, it is necessary also to offer tools for the learner to reorganize the contents, while categorizing it, and to restructure the learning material he has come across. We are now in the process of developing those tools.

References

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