Design Considerations in Hypermedia Tutorials

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Abstract: In this paper the main interest is to look at some new pedagogical possibilities in the hypertext/hypermedia environment. My background is several years of teaching without the computer, and 3 years with this new instrument in language instruction. Practice of different CAL-software systems forms the basis of the following questions and suggestions related to utilizing hypertext/hypermedia specifically in foreign language instruction at the secondary level. The aim is to discuss design considerations to be considered in the making of hypermedia tutorials.

Keywords: CAL, hypertext, hypermedia, pedagogy and software, design considerations, hypermedia tutorials.

1. Hypermedia as Instructional Tools

1.1 Hypermedia and Pedagogy

If we see hypermedia as tools for education we have to consider what they can bring to pedagogy that would not otherwise be there. In other words we should ask the famous question 'What can only computers do?'

Some characteristics specific to the computer as a hypermedia tool are:

— immense storage of information,
— quick access to the information,
— different kinds of information, including information residing on various media.

What normal pedagogical instruments can be implemented with hypermedia?

— books (storage of information),
— transparencies and videos (display of information),
— music and speech (storage and display of sounds),
— teachers (storage and linkages of information, tasks etc),
— paper and pencil (expressing ideas, questions etc).

(Doland [3] gives interesting hints on hypermedia as instructional tools and discusses the many possibilities with these new media.) As a consequence of these new media we will have to reconsider pedagogical issues in the new environment:
The questions to be asked are:

— What are the pedagogical effects of the new approach?
— What are the effects on education as we know it today?

The outlines of a revised pedagogical theory might look like this:

**Objective:** The student acquires competence with respect to knowledge and attitude and some potential of communication. If the act of communication is meant to lead to recognition of some kind and to knowledge, it must necessarily depend on the *initiative of the student.*

The ultimate goal is therefore the acquisition of knowledge - including overview of the domain, the ability of selecting relevant bits of information etc. - but also the joy of accumulating knowledge which in itself is what we all want to promote in our students. Furthermore an important goal is to make the student understand the importance of the context of any kind of information.

**Contents:** As teachers/designers we must reconsider the domains to be presented to the student and their nature/structure as well as how to present these domains. When the objects of a domain are presented in a hypermedia system, it has the effect that the student understands that all phenomena are "existing objects" that have come to existence and that they may be regulated, changed, influenced etc by the individual. For example the student will experience that he/she can call "new" objects on to the screen by clicking the mouse - and on the other hand he/she will be able to make objects disappear. It is very important that the student realizes that the objects (i.e. the bits of information) have - normally - been put there by another human being. A very promising project is going on at the University Teaching Centre, Aberdeen, concerning how to structure domains/knowledge bases [4].

**Methodology:** The domain should be presented in such a way that the student recognizes that every object is part of one or more connections involving cause and effect, analogy, association, explanation etc.

The designer therefore has to consider the relationship between the domain and the prerequisites of the student. In other words the designer has to make sure that the student does in fact recognize the different kinds of connections (links). This might be acquired by labelling the connections individually so that the student shall know at any given point which kinds of connections are available and naturally where they lead to.

Psychologically speaking we may present the individual objects in such a way that the student working with the hypermedia experiences challenge, confrontation, association, specification, explanation, exploration etc. You could put this another way by asserting that concepts like surprise and mystery should be as natural ingredients of hypermedia as they are in normal education.

What is hypermedia all about, one might ask. A precise definition will not be given here, but from a pedagogical point of view you could say that what makes a student working with hypermedia special compared to traditional instruction is among other things that *the teacher is not there.* This can lead to the conclusion that we should look for qualities in the teacher which are positive and possible to transfer to this new medium. What pedagogical properties do we want to transfer to the computer?

Of course the ability of the teacher to be a "database" of information is easily transferred to the computer. But more specifically you could argue that the ability of the teacher to ask questions and even more important to give advice are properties which are crucial if we imagine the student working alone in a hypermedia environment. A possible conclusion here can be that the hypermedia system must be able to give advice but on the other hand probably not take total control of the student.