How Studies of Hypertext-Assisted Learning Inform Educational System Design

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The question of how we learn from hypertext is more complicated than how we learn from traditional text. While all the same elements of character decoding, word recognition, sentence comprehension, and so forth remain, a number of features unique to hypertext produce added complexity. Primary among these is the nonlinear structure of hypertext. One question that many researchers have addressed is how various nonlinear structures affect hypertext-assisted learning. The literature can appear downright contradictory but some common themes have emerged in our own work and is supported by the broader literature. In a nutshell, the effectiveness of "good" structures like hierarchies tends to hinge on interactions among learners' prior knowledge, goals, and the level of activity and/or metacognition in the learners' approach. The proposed talk will explain two general conclusions drawn from the literature and explain in detail the ways in which these variables interact to influence learning. The discussion will be grounded in theories of text-based learning (e.g., the construction-integration model).

The first conclusion we make from our own work and that of others is that research on organizing tools and system structure indicates that well-defined structures (such as hierarchies) are helpful if the learning goal is to achieve simple, factual knowledge. Such structures are also helpful for domain novices. As the construction-integration model (Kintsch, 1988) predicts, learning that does not require situation model construction (i.e., integration with prior knowledge) is facilitated by transparent information structures. In keeping with research in text-based learning, however, promoting active learning is also an important consideration. By providing a structure that is highly organized or simple to follow, even beginning learners may become passive. The challenge for designers is to structure the hypertext in ways that sufficiently challenge learners while not overburdening them to the point where learning is compromised.

Our second conclusion is that ill-structured systems are often beneficial for advanced learners. Providing less obvious organizational structures has the effect of challenging the learner to seek coherence within the system. The overall effect is to promote active strategies, integration with prior knowledge, and improve learning. As the construction-integration model predicts, facilitating users to employ prior knowledge enhances learning outcomes. We do not claim, however, that ill-structured systems are always best for advanced learners, as they do not always apply their prior knowledge. A passive learner will garner little beyond explicitly stated facts from any hypertext system.

It has become clear that hypertext (e.g., the internet) is not just another technological fad. It is here for a good long while, both in school and less formal educational settings. As such, it is important for educators and researchers to understand how students learn from such technology. The purpose of this talk is to present data-based conclusions

aimed at informing the construction of hypertext systems for practitioners and the theoretical basis underlying learning from nonlinear media.

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