

Does Hypermedia Accelerate Learning?

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What Is Hypermedia?

Hypermedia provides links within electronic text for quick access to other related text, graphics, audio, or video. For instance, a brief history of the colonization of Brazil might mention the Tupi Indians, European imperialism, and Tome' de Sousa. Readers who want more information on any of these can click on the term, and if it has been designated a hyperlink, they will access more detailed information.

Since the development of hypermedia in the 1980s, enthusiasts have predicted that it will revolutionize instructional processes and enhance learning. They have suggested that hypermedia is more congruent with the nonlinear workings of the mind, engages learners, allows self-paced exploration of information, and enables access to vast amounts of information.

What is Hypermedia's Impact?

In the Fall, 1998, issue of the Review of Educational Research, Andrew Dillon and Ralph Gabbard report a careful review of experimental studies testing hypermedia's impacts on learning. Their findings are as follows:

- Eight experiments compared the learning from hypermedia and from the same content presented in print and/or lectures. One experiment found distinct advantages to hypermedia, one found mixed results, and six found no statistically significant differences. For instance, the use of hypermedia instructional materials for a statistics class proved no more effective than classroom lectures when tested over a six-week period.
- Another five experiments compared learning resulting from various forms and levels of learner control over the hypermedia. One found statistically significant results favoring limited learner control (the opposite of what had been hypothesized), three found no statistically significant results, and one had ambiguously reported results. For instance, one study found computerized instruction that allowed the learner to depart from a suggested path through the material was no more effective than the same computerized instruction that permitted no departures from the suggested path.

- Eleven other experiments examined interaction effects between learner ability or learning style. Seven found statistically significant results and four did not. For instance, one study found the more able students benefited from a hypermedia tutor and the less able students did not. Another found that passive learners benefited from hypermedia that provided cues about the availability of more information on a given topic, but active learners did equally well with and without the cues.
- Another five experiments compared learning from various ways of structuring the hypermedia. Three experiments found mixed results, and two found no differences. For instance, one study found that advanced organizers -- or a "visual metaphor" -- significantly aid learning from the hypermedia, but when both were used together, performance declined. Another study found hypermedia accompanied by a hierarchical index of the hypermedia materials did not result in more learning than occurred from the same hypermedia materials unaccompanied by the index.

Conclusion

Taken as a whole, the results indicate that hypermedia is not yet a great advance to pedagogy. The claims of vendors who sell hypermedia and the claims of educators who are enthusiastic about hypermedia should be treated with healthy skepticism.

But there are several reasons for using hypermedia despite these discouraging findings. First, most electronic reference sources are now being designed in hypermedia form and often these reference sources are less expensive than the comparable printed versions. For instance, the esteemed 32-volume Encyclopedia Britannica costs about \$1,000 in print but only \$49 in hypermedia on CD. Second, well-linked hypermedia greatly eases and speeds the exploration of questions and interests that arise while reading, and thus probably aids self-directed learning. Third, most of the above mentioned experiments involved short use of multimedia (15 minutes to a few hours) and small samples of learners, and thus the results probably somewhat underestimated the effects of multimedia. Finally, hypermedia is a relatively new technology, and its full potential as an instructional tool probably has not yet been realized.