Hypertext in Electronic Books for Children/

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Abstract

Throughout the ages the emergence of new technologies has spurred changes in mankind's life style and reshaped its cultural environment. Until 25 years ago, computing technologies have been accessible primarily in government agencies, corporations, and academic institutions. In the 1980's the personal computer has appeared, rapidly becoming a mass-market commodity, commonly available in many homes in the developed countries. Continuous evolution in home computing hardware and software has advanced its adoption as an accessible and convenient recreational activity serving all ages. Currently, an increasing amount of children spend a considerable percentage of their time with the computer environment, thereby resulting among other in a decrease in the time spent in reading fine literature.

An electronic book (e-book) is a product of the computing industry evolution. Its uniqueness as compared with the traditional printed book is in its ability to embody interactive hypertext and multimedia technologies which leverage its advantages. Interactive books are attractive to children for several reasons, among them their availability with in the computing environment, an environment that promotes playing, interaction and cooperation with other children. It also promotes the mastering of the hypertext space, which follows the concepts of associative thinking.

A hypertext system facilitates the formation of chains of links between fragments of currently-available information and new fragments of information. Thus the hypertext system augments the original meaning of the text with new meanings. The multiplicity of new meanings and links that merge into the text result in a reading sequence that is fundamentally different than that of the traditional linear text, requiring skills that are specific of hypertext. Accordingly, research attempts to qualify literacy, in a computing environment in general and in a hypertext environment in particular, whether it is traditional literacy as applied in a new environment, or rather a new form of literacy, "digital literacy". The debate is yet to be resolved, yet in practice it is assumed that in order to orientate in a hypertext

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environment and gain as much as possible from its potential, the user has to improve his/her skills, or else he/she will become lost in the hypertext space.

Links are the core of hypertext. With links it becomes possible to navigate from on location in the original text into other sources of information that were accessible to the text's author. Links turn a traditional linear text into hypertext that allows the reader to navigate within an information space that is greater than with linear text, and which allows the reader navigational freedom that is not necessarily bound to the author's original intent.

Research explores various hypertext structures, most notably a hierarchical structure and a networked structure. The former consists of chains of links that are arranged hierarchically by the author. Thus the reader is relieved of deciding which route to follow and theoretically enjoys a minimization in disorientation, at the expense of a decrease in the reader's navigational freedom. Some observe that the hierarchical structure is a primitive structure that is uninteresting and does not exploit the potential that hypertext embodies. They see such a structure as plain linear text enriched with references.

The network structure, on the other hand, is an enlargement of links that can be reached from multiple locations within the textual network. The structure can be link-rich as in the internet network or limited to some extent. Thus the network of links is present by the author yet the reader enjoys a navigational freedom to navigate across the network according to his/her preferences and deliberations. The navigational freedom comes at the expense of an imminent danger of disorientation. Certain navigational tools allow authors to decrease the reader's disorientation; some researchers say that navigational tools can entirely eliminate disorientation.

In accordance with common practices, the goal of this research is to determine the suitability of the hypertext concept for children's e-books of fine literature in the Hebrew language. The research presents the experience of children in reading three chapters from a fine children's book. The first chapter is linear (i.e., having no links), the second chapter is a hybrid of hierarchical and networked structure, and the third chapter is exclusively hierarchical. The research findings relate primarily to the experience of the children, including their impressions, opinions and recommendations as recorded in observations, expressed by them in partially structured interviews, and as analyzed from the log files of the internet server that

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hosted the electronic book. 14 Boys aged 10.5 in average, that study at the same grade in the same school participated in the research.

The research examined the following topics:

1. Will children be interested in reading an electronic literary text? The research found a definite interest in reading an electronic literary text. In the interviews the children discerned between two aspects of their pleasure in reading an electronic text: the content of the text and the computer media. An indicator of their interest in reading a literary text is the extent of suggestions and recommendations that they have expressed in order to promote and improve the implementation of the electronic book. Being particularly computer literate, the children came up with suggestions based on the likes of hypertext and multimedia, utilization of electronic presentations, photo albums, backgrounds, links, animation, annotations, music, search engine, etc. an overwhelming majority of the children have expressed an explicit preference for reading an e-book rather than a printed book.

2. Will the children be interested in reading a hypertext-based electronic literary text, in a hierarchical or networked structure? The research found a definite interest in reading a hypertext-based electronic literary text. The interviews clearly demonstrate that links augment the pleasure in reading an electronic text. Analysis of the internet server log files reveals extensive hypertext activity in the form of a high percentage of links that the children selected. Combined with the interview transcripts it becomes unsurprising that the children clearly preferred a hyperlinked electronic text over a linear text.

The networked structure is characterized by an aggregate list of links that was placed in the first paged linked to from the literary text. According to an analysis of the log files there was no explicitly extensive navigational activity through the aggregate list, yet the interviews established two findings with that respect. The first finding is that the aggregate list has a primary importance in the eyes of the children. The second finding is that there is a need for classification and annotation of the links in the list. The classification and annotation empower the readers in the process of selecting the links while serving as a navigational aid that reduces the disorientation in the hypertext.

The interviews demonstrate that the hierarchical structure does not promote interest in the reading of the electronic text, and even disrupts the flow of reading. One possible explanation is that these links were uninteresting or irrelevant.

Accordingly the third chapter has been rewritten in order to validate whether that was indeed the root cause for the children's dissatisfaction with the hierarchical structure.

3. Which hypertext structure is better suited for children's electronic literary text? The findings for this question were generated from the activity with the second and third chapters. The findings which generate from both chapters demonstrate a clear advantage of the networked structure over the hierarchical structure. Although the children eventually found the links in the third chapter to satisfy their expectations, the findings demonstrate an almost unilateral opinion that the hierarchical structure is nevertheless ineffective and less interesting to the children. According to the children, the hierarchical structure is not suitable for reading an electronic literary text.

To summarize the research findings:

1. A hypertext-based e-book is suitable for children's fine literature.

2. A fine literature e-book is attractive to children primarily in combination with hypertext.

3. A network-structured fine literature hypertext e-book, with a classified annotated aggregated list of links, is preferred over a hierarchical hypertext structure in children's e-book.

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