Hypertext for the Humanities:
Enabling Scholarly Investigation, Interpretation, and Creativity

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ABSTRACT
In the study of literature, print editorial apparatuses impose such cognitive obstacles that students are effectively barred from experiencing authentic investigations of textual change. We report the development of learningware that alleviates these cognitive obstructions, provides a rich experience of the process of investigation, and promotes immersion in the author’s writing style.

STATEMENT OF THE PROBLEM

*Hypertext Explorer* is an interactive learning environment designed to support the teaching of literature. It addresses two major classes of problems. The first is generic and cognitive, whereas the second relates to pedagogical limitations inherent in the linear structure of traditional print books and is, therefore, more germane to disciplines that focus on interpretation of texts or, more specifically, seek to elucidate the causes of editorial changes in great literature. Works of literature are not static entities. What influences drive the evolution of a literary work from one of its versions to the next?

The past four decades have witnessed a revolution in our understanding of the cognitive development of learning, especially the last decade, which has come to be known as the *Decade of the Brain*. In particular, we are interested in two paramount insights that have emerged, the first bearing on the cognitive development of expertise and inquiry, and the second involving the way that the brain processes investigations.

*Development of Expertise*

The cognitive development of expertise relates to the attainment of “transfer”, the level of learning in which a student can apply formal learning experiences to later learning and real-life applications. It is the capstone goal advocated by the National Academy of Science’s “How People Learn” program (Bransford, et. al., 2000), which illuminates the kind of learning experiences necessary to attain expertise. Essentially, to develop expertise, students must construct knowledge by grappling with foundational information.
Development of Epistemological Skills
The second design goal of Hypertext Explorer was to provide students with an authentic experience of the process of scholarly investigation in literature. Recent cognitive research indicates that human brains are not innately well prepared to conduct investigations. It may be that critical parts of the brain that we use for inquiry have evolved from perceptual regions of the brain which protect us from sensory and cognitive overload by routinely drawing conclusions on the fly, without considering alternative explanations or waiting for suitable evidence. Sophisticated epistemological insights and practices therefore emerge only from extensive practice. For this reason, the core component of Hypertext Explorer is an investigative simulation, intended to allow students to emulate the process of scholarly research.

Indeed, perhaps the most important lesson that a student might glean from this experience would emerge from contrasting two competing “big” explanations. One prevalent view, still held by many scholars in the humanities, is that works of art are deterministic entities which unfold toward an Aristotelian goal -- what the author intended. But by assuming the editor’s mantle, the student will have to consider a contending explanation—namely, that works of literature are a composite of authorial intent and other influences in a dynamic, interactive process of authorship.

Beyond the Book: Substitutive Hypertext
Teachers and researchers in the humanities profess largely through books. For all its virtues as a vehicle of communication—from duplication to ease of reading in the
bathtub—the book has two principle drawbacks for teachers and students of literature. First, each version of a book is a snapshot in time, crystallized and set in a static form that does not easily reveal the underlying and dynamic process of literary creation from which it originated. Second, despite its great variety of formats, indices, and methods of annotation—all of which suggest different ways of reading its contents—the book limits the interactions of readers with its possible texts. Books present a flat file solution to a relational problem when literature is considered over the editorial history of a work.

Attempts to explore the causes of textual change across versions of a text have been constructed within “book” technology, but these lack the necessary dimensionality and thereby impose a tremendous cognitive burden on the student. These books characteristically include a prominent version of the text, with an “editorial apparatus” in the back of the book, like a specialized index. When a reader encounters a string that has been modified from the previous version, the string is circumscribed by delimiters and indexed such that it can be referenced in the editorial apparatus, where the two variants are elaborated. In order to consider the alternative variant, the reader must commit it to memory (or copy it), return to the body text, substitute it for the printed string, and finally evaluate its significance within the larger text. This is, to say the least, a daunting cognitive task! A challenge for professional scholars, it essentially isolates less experienced students from the content area. Therefore, the third design goal of this project is the implementation of a hypertext solution that would alleviate the need to memorize and imagine competing variant strings, and thereby allow students to explore variants or textual change. For this purpose we have developed a sort of “smart” hypertext, which we refer to as “substitutive hypertext”.

DESCRIPTION OF THE PROJECT

The Hypertext Explorer system includes three stand-alone modules: the core Hypertext Explorer, Hypertext Mix and Match, and Hypertext Collator. The first two modules are learning environments and the last is an authoring tool to create additional substitutive hypertexts.
**Hypertext Explorer**

*Hypertext Explorer* the core package. It contains one window with one or more screens (only one shown at a time). Each screen contains either a single version of a story, or a comparison of two versions with substitutive hypertext wherever text strings in the two versions differ. These hypertext “variants” are imbedded in the fixed text that remained unmodified in the rewritten version(s) of a story. When a user clicks on a substitutive hypertext string the hypertext engine replaces the previous string with the next string, so the user can toggle between variants of the passage. This eliminates the need to refer to an index-like editorial apparatus, and therefore it obviates the need to memorize alternative strings or to try to imagine what the alternative string would look like imbedded in the fixed text. Substitutive hypertext removes the cognitive obstacles that hamper student use of editorial apparatuses and thereby makes an otherwise closed content area accessible.

In addition to providing improved student access, *Hypertext Explorer* is designed to serve as a research simulation for the humanities. In research mode the interface includes two sets of tools to support student experience of the process of investigation.
First, for each variable passage the student must attempt to infer the influence(s) that caused the change, like the author’s “free will” or “self-censorship” in the face of criticism, editorial “collaboration”, or “corruption” (copy error), to name a few. The student may delete old motives, or introduce new ones “on the fly”. This activity is intended to encourage reflection, analysis, and accountability; therefore, each choice must be justified by a comment or annotation in a linked text field. So, in addition to providing scaffolding to support students who are inexperienced with data collection and this style of investigation, these tools to ascribe motivation constitute a formative assessment system.

The second set of tools enables the student to publish hypothetical reconstructions of the work after the attribution of motives is complete. In this process, the student checks which motives to enable and the published reconstructed text includes only second version changes authorized by those motives. These reconstructed texts enable the student to communicate what they think the text might have looked like under other circumstances. This activity also returns the student from more fine-grained study of individual variants to a more global consideration of the whole integrated work. In as much as these reconstructed texts and their justifications represent a major summary of the student’s analysis, this activity constitutes an additional element of the formative assessment system and a product for the student’s portfolio.

*Hypertext Mix and Match: Emulating the Author’s Style.*

One of the common misconceptions that students harbor about writing is that the work emerges in a linear fashion from beginning to end. However, an author will often begin with an interesting idea, no matter where it ends up arising in the narrative. Moreover, first drafts often give rise to revisions, so an author’s work-flow may develop as a sequence of collinear story elements. *Hypertext Mix and Match* allows a student to pick and choose which story elements to use, and perhaps to rearrange them, though using the author’s own material. Lastly, completion of the reconstructed text will require the student to stitch the story elements together with their own words, while trying to emulate
the writing style of the featured author. This activity is intended to promote closer study of the author’s style.

**Hypertext Collator: Creating Marked Texts and Substitutive Hypertext**

The last module, *Hypertext Collator*, enables a student, instructor, or researcher to search for differences in two versions of a text, and to create a new marked document that can be imported into Hypertext Explorer, where it is automatically converted to live substitutive hypertext.

*Hypertext Explorer* not only enables students to enter a content area from which they have been cognitively excluded; it provides students with the opportunity to experience the process of investigation in any discipline that studies textual change (development, difference). Our teaching has been revolutionized. Our students’ experience of texts has become far more interactive. Explorer’s hypertext environment gives our students a greater role in the study, re-creation, and imitation of an author at work than print texts can.

In *Radiant Textuality: Literature after the World Wide Web*, Jerome McGann argues persuasively that “the general field of humanities education and scholarship will not take
the use of digital technology seriously until one demonstrates how its tools improve the ways we explore and explain aesthetic works—until, that is, they expand our interpretational procedures.” Our Hypertext Explorer has been designed to expand the interpretational procedures of our students and thereby to improve they way they can explore and explain aesthetic works. It will be of great interest to all teachers of literature who want to engage their students in more active interpretation and editing of texts.

Works Cited

