Conceptualizing Hypermedia Curricula for Literary Studies in Schools

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Abstract: This paper analyzes four innovative hypermedia programs for literary studies in schools, distinguishing and evaluating their curriculum orientations. Two divergent tendencies are evident. One tendency is to use hypermedia to enhance conventional instructional practices, improving the media for classroom interaction but offering little which is fundamentally new for student learning, the context of literary studies, or the processes of instruction. The second, more radical tendency is to create "hyper-environments" which restructure the social contexts for literary studies to provide students direct access to relevant expert knowledge, higher orders of thinking, and greater control over their own learning processes. This more radical approach offers profound potential for education, although its implementation may be constrained by existing educational structures and practices.

The application of hypermedia to literary studies in schools promises to further educational goals of critical interpretation, sophisticated use of language, aesthetic appreciation, and awareness of cultural traditions. However, literary studies are less obviously "teachable" than other parts of the curriculum, where learning goals and instructional procedures may be more easily defined – and thus modeled readily in interactive software programs. Empirical research has found it notoriously difficult to understand how students learn from literature in school, providing only exploratory insights into this phenonemon (Dias, 1986; Marshall, 1987; Nespor,1987; Squire,1964). Similarly, studies of the knowledge which teachers use to teach literature in schools reveal an array of complex, intuitive processes (Elbaz, 1983; McGregor & Meiers, 1983), which are probably too diverse to model explicitly

It is already evident that there are two fundamentally different approaches to the use of hypermedia for literary studies in schools. One approach preserves conventional instructional practices, but enhances them through computer-based interactive media; this choice may provide little which is new in the way of educational experience. The second approach entails a more radical reorganization of conventional curricula, especially interactions be-

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tween students, following the lines proposed by Nelson (1987). This choice offers exciting potential, but may entail too radical a departure from current educational practices for general acceptance. In many respects, the two approaches of hypermedia implementation exemplify what Papert (1987) defines to be the "centra1 question for educators.. .whether schools of the future will go on teaching the same curriculum, using computers to do the job better, or whether we'll see radical change in what is taught and what is learned in schools"(p. xxxv).

The more radical approach to hypermedia implementation in schools requires the creation of "hyper-environments" for study and learning. Here, conventional classroom routines for rehearsing skills or reciting information are superseded by interactive communities of learners engaging in complex, dynamically linked tasks. The students themselves define the relevance of these tasks within a shared, computer mediated context. These hypermedia contexts provide access to relevant knowledge and facilities to integrate and develop new learning.

The present article develops a conceptual framework to guide and assess the implementation of hypermedia programs in schools. We review four projects which have recently developed innovative classroom applications of hypermedia for literary studies. Each project proves to have exploited the educational potential of hypermedia in unique ways. We consider these differences in view of distinctions, commonly made in curriculum analysis (e.g., Miller & Seller, 1985), among conceptions of learning, teaching, content, and social context. These distinctions reveal different orientations to school curricula in each program, orientations which may significantly foster or constrain the benefits of hypermedia in educational practice.

It is worth noting that none of these programs conceives of learning in the rudimentary modes of drill-and-practice or simple skills rehearsal, which have featured in many programs for conventional micro-computers (Mehan, 1984). This may suggest that the technical complexity of interactive hypermedia tends to counter the reduction of learning to rote tasks, or it may be that the program designers who are adventurous enough to have attempted these innovations are, thus far, wary of such narrow conceptions of learning.

FOUR EXEMPLARY PROGRAMS

We have selected four exemplary hypermedia programs for analysis, drawing from among the few existing ones for literary studies in schools that we are aware of. At the time of writing, each program was in a preliminary stage of development. Future refinements are envisioned and, in most cases, are currently under way, some of which may date the present analysis out of date. We describe the principal features of each program, then assess their relation to the established curriculum. Our analysis is restricted to information reported in written documentation on each program, not from our

hand evaluations of the programs in use in schools. We have used a broad definition of hypermedia as a system which supports "non-sequential writing' or "online dynamic text" in multiple media (Conklin, 1987; Nelson, 1987). Some of the programs do not adhere strictly to a narrower definition of hypermedia, requiring that all information in the system can be browsed through bi-directional links. But it is relatively easy to see how this could be achieved through modifications in the particular instances.

The four programs are:

- Grapevine (Campbell, 1989; Campbell & Hanlon, 1988)
- Gulf Islands Novel Study Project (Vine, 1988)
- CSILE Book Club (Swallow, Scardamalia & Olivier, 1988)
- Electronic-writer-in-residence (Owen, Kearns et al., 1988)

Grapevine (Campbell, 1989; Campbell & Hanlon 1988) is an interactive array of multi-media material to supplement high school study of John Steinbeck's ***Grapes of Wrath.*** The HyperCard-based program incorporates more than 54 works, illuminating the "social and political history of the 1930s." These include: 'books, films, television documentaries, still photographs, recordalbums and sound tapes, filmstrips, magazine and newspaper articles, and more" (p. 169). Information relevant to the social context of the novel is indexed by 33 topics, making possible at least 1,836 links between topics like "dust bowl," 'alien labor," or "New Deal," the novel itself, and the various media resources,

Annotations, suggested teaching activities, and references are provided, in addition to a system for "skimming through the material, browsing, searching, or studying it thoroughly" (p. 60). The project provides extensive resources in different media for study of social issues relevant to the novel. It presumes that 'a teacher deals with a novel not as an isolated piece of literature, but as one reflecting the times, the issues, and the author and other writers, artists, thinkers, and survivors" (p. 60) of the historical period. Developments are presently under way to make the program user-adaptive by providing facilities like on-screen note pads and authoring systems for use by individual teachers or students (Campbell, 1989).

The Gulf Islands Novel Study Project (Vine, 1988) provides a generic format to guide children's analyses of novels, using print and graphics media. It consists of hypermedia templates which, for any given novel, prompt students to: produce analyses of characters and plot; write critical reviews; prepare and integrate background information about an author; and answer hypothetical questions posed by a teacher (called "What if?"). For a specific book, students supply relevant information under each category using text, schematic, and pictorial forms. Links across media and topics are automatically established for users as they work with the program.

A demonstration version shows children's uses of the program to report on their interpretations of E.G. White's ***Charlotte's Web*** and George Selden's ***The***

Cricket in Times Square. Pedagogically, the program aims "to be simple enough for first-time student users to use, and for teachers to easily modify to suit their students' needs"(p. 1). Technically, the program is designed "to keep the stack small enough that it could be used with a minimum of storage space in a maximum number of hardware configurations." (p. 1) Students are expected to use the program to "actively interact to display their skills, ideas and understanding" (p. 3).

The CSILE Book Club is one aspect of a larger project developing and piloting computer-supported intentional learning environments (CSILE) for schools (Scardamalia, Bereiter, McLean, Swallow & Woodruff 1989). For literature study, grade 5 and 6 students prepare reviews of different novels and then enter their reviews into a collective data base. Chart facilities, linked to the text media, also permit students to create graphics to accompany their reviews. Books are chosen by the students; reviews are written to interest other students in reading the books. Students meet in groups to interpret, critically assess, and try to learn from one anothers' reviews (Woodruff, et al. 1988). Their discussions and interactions with the computer texts are prompted by on-screen cues guiding the children's thinking toward: high level questions; summaries of their existing knowledge; new insights; bases for agreement and disagreement; plans for further study; and so on.

Students append critical comments to the original reviews through on-screen notepads. Original drafts of the reviews are then revised by their authors, incorporating the peer feedback, to pass from a preliminary "candidate" status to a final "published" status, as judged by peer consensus. The completed reviews are then "catalogued" in the larger data base (by students) using a special propositional syntax (based on keywords and logical 'arguments' accessible to children). Students are also asked to determine principles for effective book reviewing, based on their assessments of their peers' collective work.

The computer's procedural supports for the discussion groups derive from earlier research on cooperative reading with children (Swallow, Scardamalia & Olivier, 1988). Students' thinking strategies while reading and discussing new texts were evaluated and modeled on adults' strategies. Pairs of students were assignedjoint roles as "directors" or "actors";)) directors aimed to draw out relevant knowledge, conceptual problems, and new learning from the actors. Based on analyses of these interactions, prompts were written to foster optimal thinking strategies, using the computer program to guide students' discussions, without adult support. The aims of the program are to foster "intentional learning" (Bereiter & Scardamalia 1987), applying principles from recent research in cognitive science to direct children's development of higher order thinking and self-control.

The Electronic-writer-in-residence (Owen, Kearns, et al., 1988) set up an on-line computer conference for poetry writing and commentary among grade ten students in Toronto, a poet in Vancouver, as well as other high school students in Vancouver and writers in other locations, Drafts of poems were

submitted by students and the "resident" poet, collectively critiqued, then revised for further display. The project lasted 5 months, compiling computer interactions which are catalogued and available for wider distribution by diskette. Above and beyond the fostering of creative writing, the rationale for the computer networking was to provide an "equity of use, placing students in control of what to write, when and where to 'send' it, and how to respond" (Owen, 1988, p. 1). In evaluating the project, Owen & Kearns (1988, p, 8) consider participants learned much about "human interaction, communication, publication (making our work public), and the nature of this strange and wonderful medium that connects us in such intimate ways across the continent."

CURRICULUM ORIENTATIONS

These applications of hypermedia are innovative in different ways, each devising very particular applications for specific issues in educational studies of literature. Though it is clear that hypermedia applications for literary studies in schools are still in a preliminary stage of development, the diversity of these few programs is, we think, instructive. A closer, comparative analysis of their curriculum orientations reveals much which might not be apparent from our previous outline of their principal features.

Instruction

Instruction can be conceived ***as*** the ***transmission*** of information, This orientation is most evident in the Grapevine project, particularly in its early phases before the development of student personal notepads and individual authoring tools. Initial reports on Grapevine emphasize how hypermedia can enhance the potential to convey relevant data in different media to students. A second orientation is to consider instruction as the ***transaction*** of information In the CSILE Book Club and the Electronic-writer-in-residence project, information is negotiated, through and around the hypermedia interface, by classroom participants. Instructional supports appear in CSILE's procedural prompts or the Electronic-writer-in-residence's feedback. But this occurs in response to decisions established principally by students themselves. In the Novel Study Project, students' transactions of information occur outside of the hypermedia environment, while reading or researching information. Hypermedia is used later, to display students' achievements rather than to mediate or convey them. This might be called a ***demonstrative orientation*** to instruction, where tasks are completed for students to display information in the form of an achieved product.

Content

In the two projects which focus on the study of novels, the books themselves (i.e., Steinbeck's ***Grapes of Wrath*** or White's ***Charlotte's Web)*** provide concrete curriculum content, whereas in the Electronic-writer-in-residence the emphasis is on how students generate their own material (poems) as content. The

CSILE Book Club divides its concerns between the processes of writing and revising book reviews and the study of various novels. Students' thinking strategies are thus given equal emphasis with the objects of study.

The modes for organizing curriculum content likewise differ. Grapevine and the Novel Study Project aspire toward an ***encyclopedic organization*** of content relevant to single novels. Thorough study of one literary item, and its related features, is aimed at. In contrast, the Electronic-writer-in-residence project and CSILE organize curriculum content in more of an ***episodic mode.*** Individual poems or book reviews produced by students serve to determine the curriculum content, creating a diverse, dispersed content for deeper analysis.

Learning

Different conceptions of students' learning underpin the four programs. In Grapevine, learning is considered to occur mainly through students' ***compilation and integration of knowledge.*** Hypermedia serve to foster students' bringing together of interrelated information into coherent conceptions. Though knowledge compilation does feature to some extent in CSILE, the Electronic-writer-in-residence, and especially the Gulf Islands Novel Study Project, these programs present goals for student learning which aim to ***model higher orders of thinking*** by providing developmental supports in complex tasks.

In CSILE, strategic supports for thinking are synthesized into procedural facilitations on the computer screen, which guide the social supports of peer discussions and self-analysis. Peer feedback likewise serves to foster reflective thinking and self-awareness of performance. In the Novel Study Project, a more general and conventional set of rhetorical organizers direct student performance on specific tasks and appear through the teachers' questioning about hypothetical situations. In the Electronic-writer-in-residence, the responses of an experienced poet and of peers to students' writing serve to model expert thinking in relation to their own work.

Except for the early versions of Grapevine, complex computer-baaed writing skills also feature as a substantial basis for learning, prompting student practice, analysis, and refinement of thinking. CSILE and the Electronic-writer-in-residence appear, however, to be the only two programs which provide a concrete basis for students' development of self-control over their own learning. The Novel Study Project presents task performance in the hypermedia environment as the end point of student activity, providing little support for learning to extend to other contexts or to be assessed strategically during the learning process.

Social Context

One can approach this issue by distinguishing between hypermedia contents that ***areprogram-generated, teacher-generated, orstudent-generated.*** This distinction is important for issues like teacher adoption, preparation-time, and curricular flexibility (see Riel Miller-Souviney, 1984). Grapevine,

for instance, has been developed as a resource containing massive quantities of information. Without the authoring system now being developed its sheer quantity of information may make it difficult for teachers or students to use in classroom instruction. Similarly, CSILE provides a complex environment for learning and student interaction, such that teachers may find it difficult to integrate into existing routines for classroom study, without significantly reorienting conventional conceptions of student learning or instructional organization. For instance, Cumming's (1988) study of two experienced teachers using the program found that it took about six months for them to successfully intregrate CSILE into their teaching routines. New systems of classroom management, interaction, and assignments had to be established. Concrete obstacles to adopting the 'hypermedia curriculum" included: learning how to intregrate it with the conventional curriculum; having to account for students' achievements in new ways; and reallocating students' schedules to complete tasks.

In contrast, the Novel Study Project offers simple technical and pedagogical formulae, making it easily transposable from teacher to teacher, without requiring substantial modifications to conventional curricula. For the same reasons, though, it is unlikely that its introduction into classes would have much of an impact on changing the social context of learning in schools. This suggests that the other three projects come much closer to realizing the promise of hypermedia to offer genuine curricular restructuring.

CSILE and the Electronic-writer-in-residence are notable for foregrounding student input, decision-making, and interaction, thereby providing an environment for students to assess and advance their existing knowledge. The organizational structure of these two programs require that the hypermedia create environments for literary study which are self-sustaining and pedagogically interactive, without the need for teacher-dominated instruction usually conducted in schools.

This distinction marks the major issue in the development and implementation of hypermedia programs for literary studies in schools. The relationships of hypermedia to the social contexts of education suggest that a central factor in program design and implementation is the matter of who a program enables to make principal decisions about classroom study and learning – students, teachers, or the program? If the substantive content and uses of a program are largely pre-determined, as in off-the-shelf, commercially available hypermedia courseware packages, these may be difficult for teachers to adopt to their usual practices or students to integrate with their studies of other literature. If teachers are prompted to determine the content and uses of hypermedia, following conventional practices (as in the Novel Study Project), it is probable that the potential uses of hypermedia will be reduced to task routines which are not, fundamentally, unlike those now occurring in classrooms using less sophisticated media.

In view of these problems, it appears that the two projects (CSILE and Electronic-writer-in-residence) which require innovative restructuring of

social relations among students, teachers, and the hypermedia may be the optimal means for attaining hypermedia's educational potential. Students are put in the position of making decisions about their own learning and social interactions – the hypermedia environments guiding them toward appropriate learning goals. From a teacher's viewpoint, however, these programs may be considered too time-consuming or unusual to manage within the routines of teaching they have already established. Practical issues like time allocation, the physical organization of the classroom, and students' work schedules need to be restructured and established anew.

SUMMARY AND IMPLICATIONS

The major issue which emerges from our analysis of the curricular impact of these innovative programs concerns the extent to which hypermedia programs might, or really can, reconceptualize approaches to literary studies in schools. The greatest promise to achieve this goal appears in programs, such as the CSILE Book Club or the Electronic-writer-in-residence, which use hypermedia environments to create functional contexts for learning and interaction far beyond those practiced in conventional classroom instruction. These programs come closer to realizing the profound changes in society's exchange of information envisioned in Nelson's *Literary Machines* (1987). Hypermedia create educational contexts which differ qualitatively from ordinary schooling -- supporting learning which is student-generated and transacted, directly linked to relevant expertise, episodically managed and integrated, and cognizant of its own emerging existence and terms of reference.

Alternatively, there are models for the development of hypermedia programs which conform more closely to conventional instructional practices – retaining their fundamental characteristics, but enhancing their presentation or multiplicity. In this sense, Grapevine functions much like a rapidly-accessed, topically-organized, multi-media library. The Gulf Islands Novel Study Project extends usual instructional formula for student assignments into hypermedia formats. In either case, literary studies are conceived mainly as the performance of routine analyses or the transmission of information, much as they usually are in schools. In these cases, hypermedia certainly provide a richer means of displaying student achievements or accessing multiple information sources. But expectations for student performance remain much as they would be without the hypermedia environment.

How can we expect these two routes to hypermedia implementation to fare in schools? Programs adhering to conventional curriculum models are likely to be well received. We can even expect them to emerge widely, in "grass roots" fashion, as innovative teachers adopt their usual practices to accommodate these new media (Aoki, 1987; Riel & Miller-Souviney, 1984; Snyder, 1988). Such hypermedia programs present predictable and orderly tasks, which can be organized and accomplished neatly by teachers and students with little deviation from usual policies.

At the same time, however, we can expect such hypermedia programs to miss the opportunities for learning available through the higher route designs. As recent research on the uses of micro-computers in classrooms has started to show, teachers as well as students tend to reduce the cognitive demands of classroom computer tasks in areas as diverse as: self-directed learning (Cumming, 1988); composing skills (Cazden, Michaels & Watson-Gegeo, 1987; Dickinson, 1986); problem solving through Logo programming (Hawkins 1987); science projects (Martin, 1987); and school-to-school networking (Riel & Miller-Souviney, 1984). Conventional curriculum models for educational computing quickly see computers come to function as "electronic work-sheets," having necessarily to fit into the usual organizational constraints and patterns of classroom instruction (Mehan, 1984).

On the other hand, the educational potential of the higher route hypermedia programs is enormous. We might see their value in their restructuring of the social contexts of learning so as to create a "mindfulness" (Salomon, 1986) in students which is capable of producing higher orders of thinking, access to expert knowledge sources, and self-control of learning processes. But is a restructuring of educational contexts necessary to achieve such aims? Looking at the few case studies describing effective implementation of hypermedia in other settings, it would appear that this is so. At least, it has been reported as such for technical writing (Barrett & Paradis, 1988), multilingual international networking (Cohen, Levin & Riel, 1985), university composition (Slatin, 1988) or literature study (Garrett-Petts 1988). In each instance, project reports have described how new patterns of organization, functional roles, and human dynamics have necessarily accompanied effective introduction of particular hypermedia into these instructional circumstances.

This makes us wonder how such restructuring might be feasible, on a broad scale, amid the conservative and conserving forces of schooling. Will teachers, students, school administrators, consultants, policy-makers, and parents support a nearly anarchistic organization of groups of learners pursuing individually-determined aims? What will the perceived achievements of learning be, and how could they be evaluated? How will forces of educational conservatism -competency tests, standard curricula, or established policies - - confront such a radical departure? How could such restructuring be introduced equitably across socio-economic levels, given the costs, supports, and teacher development required (Sheingold, Martin & Endreweit, 1987)?

These questions, we believe, are the real challenge of hypermedia innovations for educators. None bear easy answers. Our analysis can, in closing, only offer several principles to guide hypermedia developments of more conventional curriculum models, gently toward the higher road-by suggesting they aim to provide students with:

- access to, and integration of, quantities and qualities of information not usually accessible through a single medium or conventional instruction;

the means to engage purposefully in the transaction of information in relation to their existing knowledge and skills, above and beyond the transmission of new information and the display of achieved tasks;

- a functional learning environment around the computer interface, involving the allocation of shared responsibilities and goals among groups of users;
- supports to foster individual organization and decision-making leading to increased self-control;
- prompting of higher orders of thinking about literary material; opportunities to model peer and adult learning processes not usually offered in schools.

Ultimately, we find ourselves in agreement with Cynthia Solomon (1988) who points out that "different computer environments give rise to different computer cultures." Solomon argues that "children and teachers who are learning to use computers need to develop an awareness of [these] different computer cultures, and they must blend these cultures to create their own." (p. 13). We find it useful to substitute the term "hypermedia" for "computer" in Solomon's statement for, in fact, a hypermedia environment is one in which a computer drives and integrates the nonlinear interaction between learners and a variety of different information media. Within this context, we suspect that the most successful implementations of hypermedia programs in schools will be the ones in which teachers and students create their own cultures supported by non-traditional, "hyper-environments" for learning.

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APPENDIX A

Technical aspects of the four programs are as follows:

The Gulf Islands Novel Study Project uses HyperCard stacks as templates, which are set at "scripting" to permit browsing and adaptations by users. Graphics are collected on MacPaint and FullPaint and can likewise be altered by users. CSILE was designed for UNISYS ICONS (for Ontario schools) but has recently been implemented on Mac II's and SUN workstations. A fileserver links 16 student stations equiped with their own RAM. Files are contained in a common root directory or users' home directories, forming a group database of (1) 'public' files accessible to all users and (2) 'private' files for individual

users, which may be stored in either location. Prompts, icons, and keywords store data in textual and chart forms, as well as providing interfaces for users in specific environments like: “new learning”, “planning”, “questioning”, or “timelines”. The Grapevine project runs on a Macintosh Plus linked to a Pioneer 4200 videodisc player and monitor, using headphones for sound. HyperCard software controls the program, using a guide stack for browsing. Plans are underway to make the program available commercially (Campbell 1989). The Electronic - writer - in - residence project was set up as an online interactive computer conference which runs on the Simon Fraser University computer Network on an IBM 308 1 mainframe under release 6.OD of the MTS operatingsystem. The computer conferencingsoftware which runs under MTS is called *Forum. Participants (students, teachers, and poet) accessed the conference using a variety of microcomputers (Macintosh, IBM PCs and UNISYS ICONS) with many different communication software packages and 1200 baud modems.

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