Understanding Hypertext in the Context of Reading on the Web: Language Learners' Experience

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This paper explores second language readers' understanding of hypertext in the context of reading on the web from a qualitative research paradigm. A total of six undergraduates English as second language (ESL) students voluntarily participated in this study. The results showed that students' understanding varied depending on the presentation of hypertext readings. The findings suggested that students saw hypertext as a valuable bank of information when they were exposed to linear hypertext. When they encountered the non-linear hypertext, they perceived it as a maze and experienced disorientation. It is concluded that neither computer nor text reading skills alone are an adequate basis to start using hypertext technology in language classrooms.

Hypertext is a non-sequential (non-linear), electronic, textual, hypermedia, and interactive environment. Hypertext creates an interactive environment where reading is contingent upon computers and possible by multiple sources of information linked together. Some researchers consider hypertext reading an invention as important as the printing press (i.e., Bolter, 1991). Having started as an idea in 1940s by Vannevar Bush's proposal, the development of hypertext and the emergence of hypertext environments have accelerated today. With the era of the Internet and multimedia technology, hypertext environments have moved from an imagery level to being a real part of our lives, especially of our education

As we become more able to digitize a wide variety of information and expose readers to more digitized media on computer screens, how a new technology such as hypertext can be interpreted and shaped by a community of L2 readers, as well as the way in which L2 readers understand, interpret, and value hypertext reading material as a new medium, is worth exploration. Thus, there is a need for research to discern the usefulness of hypertext technology in language classrooms.

Reading Patterns in Hypertext Environments

With the advance of multimedia technology, researchers have begun to investigate the ways in which hypertext could be employed to enhance reading experiences. One of those enhancements is the Electro Text Project, which was developed by Anderson-Inman, Horney, Der-Thanq, and Larry (1994) to help middle school students read and comprehend stories. The Electro Text Project was developed for reading classes in two eighth-grade classrooms. The project includes resources, vocabulary definitions, background information, text glossaries, graphic overviews, pictures, sounds, and self-monitoring comprehension questions in 44 pages (Anderson-Inman, et. al., 1994).

Based on research they conducted with the Electro Text Project, Anderson-Inman, et. al., (1994) presented three types of hypertext readers. The first one was called *Book Lover*, a person who typically reads everything in linear form, and uses available resources sparingly. The second type of hypertext

reader was called *Studier*, an individual who navigates through 44 pages in a linear form, uses backward navigation for reviewing and checking, and more frequent use of comprehension monitoring questions. The last type of hypertext reader was coded as a *Resource Junkie*. Students of this type report being excited by the resources provided, particularly by computer-generated speech. *A Resource Junkie* spends most of his/her time looking for and using resources. It is the Resource Junkie, in fact, whose navigation patterns and strategies are the most varied and complex.

The research on hypertext reading patterns brought up two important issues. First, there are a variety of hypertext reading patterns in existence among hypertext readers. Second, although hypertext is defined as non-linear and non-sequential in nature, many readers approach it in a linear and sequential manner. To conclude, a considerable body of literature exists concerning the general reading patterns exhibited during conventional reading. However, since hypertext is a rather new medium that presents text in a non-linear, electronic form, little information is available on what L2 readers understand from this new form of text.

Intertextuality and Readers' Beliefs about Multiple Texts

While many computer and cognitive scientists are devoted to the idea of designing better hypertext environments and exploring the mental processes and consequences of learning with hypertext (Spiro & Jehng, 1990; Mc Allese, 1990), far less research has been done by first language (L1) and second language (L2) reading researchers and/or reading educators to assess hypertext's potential impact on and implications for reading and literacy education.

Research on beliefs and reading is mostly focused on either single or linear-text reading (i.e. Williams, 1994), students' approaches to the authorship of text (i.e. Garner & Alexander, 1994), or teachers' perceptions of texts and their beliefs (i.e. Anders & Evans, 1994). Some researchers have also investigated nonlinear text and readers' beliefs about reading multiple texts in both the L1 (i.e. Spivey, 1997), and L2 the literatures (i.e. Chi, 1995).

In a study looking at L2 readers' approach to multiple texts, Chi (1995) investigated 10 Taiwanese College students' reading processes. Based on verbal reports, free oral post-reading responses, and interviews, Chi reported four types of patterns that appeared from L2 learners' reading process: story-telling, integrating, evaluating, and associating. Chi (1995) also commented that readers integrate their prior knowledge and experiences as well as learning preferences and interests, all of which derived from their cultural backgrounds.

Studies concerning readers' approach to hypertext are at its nascent. To explore how experienced computer users approach hypertext readings and how their prior knowledge and beliefs play a role in discerning information, Altun (2000) conducted a case study with two L1 experienced computer users. The data revealed five categories in readers' approach: *A link does not do much unless it is appealing, Electronic text is faster, Page design can cause disorientation, Looking up a word*, and *Don't have the pen*. These categories indicated that experienced computer users realized and benefited from this differently structured electronic environment, yet they needed to be able to structure and integrate the information in meaningful ways during reading in hypertext.

Experienced computer users showed a pattern of being able to control their reading process based on their prior knowledge, existing schemata, and their beliefs about hypertext reading. In addition, based on their prior knowledge and beliefs, experienced computer users developed strategies to minimize their disorientation. The question remains, however, what L2 readers understand from hypertext in the context of reading in a web-based environment. Reading hypertext fiction: Is it a new form of hypertext?

Hypertext has been seen as embodiment of certain ideas about texts in the domain of literary theory. Hypertext fiction can be characterized as a new emerging genre that has been made textual fragmentation and complex cross-referencing possible with a theoretical view of the text (any text) as de-centered and open-ended (i.e., Joyce, 1988; Burbules & Callister, 1996).

Landow (1997) argues that, "over the past several decades literary theory and computer hypertext, apparently unconnected areas of inquiry, have increasingly converged" (p. 2). One of those connected areas is fiction. Hypertext, as in the metaphor of writing space (Bolter, 1991), is "a new laboratory in which to test ideas... [thus] an experience of reading hypertext or reading with hypertext greatly clarifies many of the most significant ideas of critical theory" (Landow, 1997, p. 34).

Another definition to hypertext fiction is put forward by Howard Becker. According to Becker (n.d.), it is a new form of art, which can only be valued by the participants from the art world. In other words, hypertext fiction was not meant to be agreeable, instructive, edifying, or enjoyable; but rather it was to be considered to have all these qualities by those in a world of like-thinking people.

Sample screenshots from a hypertext fiction web site were presented in the following figures 1, 2, and 3.

**Figure 1. A sample hypertext fiction: Mercury**
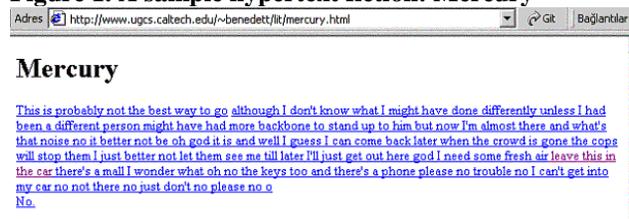
This hypertext fiction, entitled Mercury, is all underlined with hypertext links to let readers choose their way of reading. Simply by looking its structure, it is difficult to make an inference about where to go. Readers were expected to choose their own way of reading at their own pace. Once they clicked through the links, they could read the rest of the fiction through the opening screens, which are shown in Figures 2 and 3.

Figure 2. A followed hyperlink
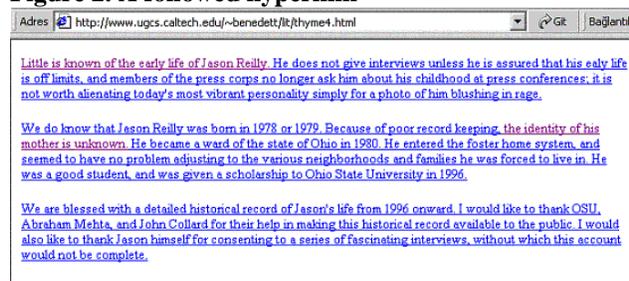
Figure 3. Another followed hyperlink
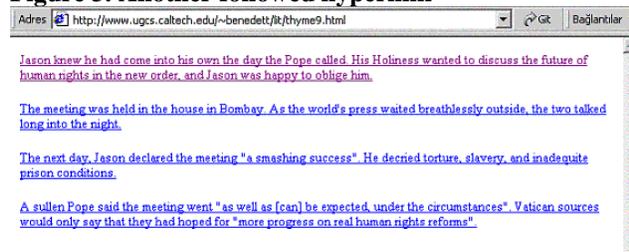
Literary scholars are interested in exploring hypertext fiction due to its structure and interactivity. It can further be said that the research focus is not only on the structural components of hypertext, but also on its use and user outcomes (e.g., Miall & Dobson, 2001; Curry, Haderlie, Ku, & Lawless, 1999). In an earlier research study, Moulthrop and Kaplan (1991) investigated how their first-year literature students gained a sense of power in their reading and in their writing. The researchers gave assignments to students to read Michael Joyce's *Afternoon: a story and other hypertext fictions*. Based on their findings, the researchers claimed that hypertext fiction, because of its interactive nature, helped students gain a sense of power in both reading

and writing. The researchers also went further to suggest that such a "social act" would not yield to a closed, empirically correct reading since spontaneity, collaboration, and process has been emphasized in literary studies.

In a recent research study with L1 readers who read either a simulated literary hypertext or the same text in linear form, Miall and Dobson (2001) conducted two consecutive studies to examine the differences between reading short stories on computer when they were in either a structurally linear form or a hypertext form. The researchers found that the hypertext readers tended to feel either confused during their reading, or to feel that they must have missed something in contrast to the linear readers. In all, 75 per cent of the hypertext readers reported varying degrees of difficulty following the narrative, whereas only 10 per cent of the linear readers were reported to have made similar complaints.

Miall and Dobson (2001) conclude that hypertext discourages the absorbed and reflective mode that characterizes literary reading as far as readers' transactions with the hypertext are concerned. Moreover, despite the prior work of influential commentators such as Bolter and Landow, hypertext is still at a pre-paradigmatic stage; that is, there is no accepted theoretical framework in which to locate it, and no settled body of knowledge on either the nature of hypertext or its appropriate applications.

A different hypertext structure enforces readers' interaction with the reading. During this interaction, readers were reported to experience disorientation and difficulty with orienting themselves to the reading. For some readers, this diorientation may correspond to a new form of reading as well as writing. Yet, how L2 readers understand hypertext fiction still remains a salient question to explore. Hypertext as both a new technology and a genre is a new area of study to explore. Differently presents texts may lead to disorientation due to the very nature of hypertext structures. On the other hand, this may well be said to be successful control of navigation rather than disorientation. One cannot hope to properly address the issue of optimum usefulness of hypertext at any level without knowledge and understanding of the natural processes of hypertext reading. The research reported here, therefore, is best viewed as an attempt to further describe the l2 readers' hypertext reading process and their awareness of hypertext.

Study Design

This study is a case study to explore L2 readers' approach to hypertext readings in an academic reading and writing context from the

qualitative research paradigm. A case study is the preferred strategy among researchers when the investigator has little or no control over the phenomenon within a real life context (Yin, 1994). According to Merseth (1996), to be effective, case studies need to be situated in a real world context, rely on research, and foster the development of multiple perspectives. Since hypertext as an environment is a new way of presenting text and is used to provide a real life context for academic reading and writing purposes, this study is designed as an exploratory case study to approach the phenomenon within a real life context.

Entrée and Data Collection

This study was conducted at an academic reading and writing classroom in a mid-western university campus in the USA. The academic reading and writing course was designed for non-native speakers of English who did not succeed in the proficiency test, which was part of the university acceptance policy and administered by the English Department. The course was a required one to improve students' language skills and eventually attend Freshman English. The class met two times a week in separate sections for a total of six credit hours per week. A different instructor instructed each section. The current research was conducted only in the reading section where students were asked to read from both hypertext and their own textbooks.

The data was collected during an 11-week period, through observations, semi-structured and structured interviews, and a questionnaire. Additionally, journal entries were utilized to further understand the process students experienced. To gather data for the research and present course material to students online, a web page, which included information about the syllabus, was designed for the course in cooperation with the classroom instructors. As part of the class assignments, students were required to read meta-cognitive passages in essays and fiction both from their textbooks and hypertext sites on a weekly basis. Consequently, students were asked to reflect on their ideas, experiences, and feelings about the selected passages in their journals. Their journal reflections were taken as is without making any changes in their written language.

To enable students to submit their journal entries online, an active server page (ASP) database was created and linked to the class web site by the researcher. The questions were posted on this web page on a weekly basis since this was the only way for students to get to the journal entry prompts. This database constituted part of the research data to be analyzed.

Participants

The participants in this study were six volunteer undergraduate ESL students differing in gender, ethnicity, English experience, and in their self-perceptions of computer expertise. The participants were given pseudonyms. Dr. Beril will be used as a pseudonym for the classroom instructor. Rick was a 30 years old Venezuelan student studying finance. He studied English for eight months, starting from the time he arrived in the U.S. Jennifer was a 19 year old Korean student studying business. She studied English for four years and attended high school in the U.S. Linda was a 22-year-old Brazilian student, majoring in arts and sciences. She studied English for eleven years, although she has only been in the U.S. for a month and a half. She originally visited the U.S. for about eleven months as an exchange student while attending high school. She also visited the States the year before, staying about five months. Brown was a 21-year-old Chinese student, studying accounting. She studied English for five years. Ned was a 23-year-old Kenyan student who arrived in the U.S. in the fall of 1998. Although he had been in the States for only a couple of weeks during the research period, he considered English to be his native language, simply because he had been educated in an English-medium school in his country, and spoke English at home. Although he claimed English as his native language, he had still not passed the university mandated English placement test. Adam was an 18-year-old pre-engineering student. He was from Nigeria and felt English was his native language. Adam was the only student in the classroom who identified himself as able to speak more than two languages.

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Hypertext Reading Passages

The participants were provided with 18 on-line web-based readings related to the topics within the context of L2 academic reading/writing. The materials revolved around essays, (i.e. solitude, loneliness, etc.), traditional and cultural events (i.e. folk tales, short stories from various countries), and hyperfiction (i.e. fiction in hypertext format). The selected readings were in both linear and non-linear format in four different genres: exposition, hyper-fiction, non- fiction, and narration (See, Appendix A).

Questionnaire

A questionnaire was used to collect data about readers' background and their computer experience at the very first meeting with the participants (See, Appendix B). The data collected from the questionnaire was used to present demographic data about the participants. It was not utilized to further conduct any quantitative analysis.

Interviews

Both semi-structured and structured interviews were conducted with participants. A structured interview was conducted with each participant to gather additional descriptive information. Semi-structured interview sessions, on the other hand, were held with certain individual cases after hypertext reading sessions in the class throughout the course. Those individuals, who were asked to join voluntarily, were interviewed on their journal reflections before each class. With probing questions, the selected individual cases provided in-depth information about their understanding of hypertext and hypertext readings they had done during previous classes (See, Appendix C).

Data Analysis

The data collected from the different sources were prepared, examined, transcribed and word-processed for analysis. The word-processed transcriptions and students' journal entries from the database were entered into qualitative research analysis software (Folio Views version 4.2) to be separately coded and analyzed. Initially, the data analysis included two components: A reflective field log and analytic files (Glesne & Peshkin, 1992). The analytic files helped the researcher organize the data into broader categories such as interviews, quotations, and journal entries. Early files for this research included interviews with the participants in the study and regular journal entries for their course readings. The reflective field logs, on the other hand, provided more detailed data about the setting and participants. As Marshall and Rossman (1995) claimed, this approach was ".rich in portraying the values and beliefs of participants in the setting" (p. 85).

Later data analyses consisted of a content analysis to code and categorize the data in a systematic way (Glesne & Peshkin, 1992). Content analysis guided the researcher in determining where the greatest emphasis lay in finding the themes in the data (Berg, 1998). As a result of this content analysis, the data were categorized according to the research questions asked in the study, and each category was dealt with within its own context.

During the content analysis, metaphors were imposed on the data to better comprehend the nature of hypertext reading in this particular setting. According to Patton (1990), data present ".a new set of metaphors for [what] we observe, how we observe, and what we know as a result of our observation" (p, 82). Metaphors are especially powerful in creating conceptual vehicles for understanding, and play a central role in the construction of social reality (Lakoff & Johnson, 1980). Consequently, the two main categories emerged in how the students read

hypertext: "A link must be attractive" and "What is a link?"

Findings

The purpose of this study was to explore how L2 undergraduate readers approach hypertext in an academic reading context. The data revealed the fact that L2 readers' background knowledge about hypertext played an important role in their approach both hypertext links and readings. The findings suggested that when students were exposed to linear hypertext, they saw it as a valuable bank of information from which they could benefit. When they (the students) encountered non-linear hypertext and a more complex design, they perceived it as a maze, and experienced disorientation.

Patterns in ESL Students' Understanding of Hypertext Readings: Metaphors in Context

The patterns that emerged from this study suggest that, regardless of the level of experience in computer literacy and language proficiency, students in the academic reading class showed two different patterns depending on the format and the type of hypertext readings. These patterns can be described in two metaphors: "Hypertext as a bank of information" and "Hypertext as a maze". Table 1 displays the distribution of readings according to their calendar in the syllabus, and the categories embedded in the data during hypertext reading sessions.

Hypertext as a bank of information. Regardless of the differences among students' levels of computer experience, their approach to the selected linear hypertext readings showed more similarities than differences. These similarities suggest that students' approach linear hypertext readings in an academic reading class were as follows:

A. Linear hypertext was a source of information that as readers, they believed they should have control;

B. Even though there was an extensive amount of information in the selected linear readings, the students felt they could make decisions about what was important and what was not;

C. As a result, students believed that the information provided to them was helpful for their writing in that it created an environment for them to connect reading and writing in a meaningful way.

Linear hypertext readings in various genres provided students with information about the nature of academic reading and writing (i.e. how to write an essay and a summary, to paraphrase, etc.), and the cultural contexts (i.e. traditional and cultural events, folk tales). Most of the linear readings included non-

fiction readings. Therefore, I will refer to non-fiction interchangeably with linear format, unless otherwise mentioned.

Table 1: Patterns, Reading Sequence, Hypertext Genre and Format in Selected Readings

Patterns	Weeks	Hypertext Genre	Hypertext Format
A bank of Information	1, 2, 3b (one day), 4	Non-fiction Expository	Linear Linear
	5	Non-fiction	
	6b (one day)	Hyper-fiction	
	3a (one day), 6		
A maze		Narration	Non-linear
A bank of Information	9, 10	Narration	Linear, Non-Linear

The reading for the second week included three sites with the task being to select one of the three and write a reflective journal entry. When the task included multiple sites, the students' role changed from participant readers to decision-makers where they either accepted or rejected what to read depending on what was important for them. In his journal reflection, Rick described how he approached the process, including his navigational problems.

"To chose what link to read, I visited each site and then I decided read HOW DO I DEAL WITH LONELINESS? To access it was very easy and I didn't have any problem. When I finished my reading, I wrote the journal" (Rick, Journal #5).

According to Rick, "Reading on line is faster and you can choose what is important for you" (Interview notes on perceptions of hypertext reading: Rick). Rick considered non-fiction hypertext readings as a source of information to evaluate, investigate, and access to the information faster. In the following statement, he explicitly stated his perceptions:

"These readings gave me tools to be a critical thinker and accept or denied some readings, since now I know that I have to investigate the evidences to be sure that the author's affirmations are correct" (Rick, Journal #5).

For some students, the non-fiction hypertext readings seemed to be a cumbersome process, at least at the beginning. There were several times they thought they were confused during reading in non-fiction. However, when the task turned out to be mere reading, rather than a technology struggle, students found success with no occurrences of disorientation. Brown, for example, was one of those students who articulated this process in her journal:

"One thing I have trouble with is the on-line address. It gives me a headache once time. I forgot the address to get into the site I found the previous day. I had tried so many paths and addresses, but still can't get in. An also I have no idea about the address or the path which can directly get into the site I want. I always get it after taking many useless paths and opening many unwanted sites. However, in generally I still can handle it" (Brown, Journal #6).

Students' journal entries represented clearly how students understood non-fiction readings within the academic reading context. Students approached the links with the purpose of making use of the information in their writing, and the hypertext readings were the source of information for them when needed. Regardless of their computer experience, all of the students perceived that these non-fiction-reading sites would help them write better.

In the fourth week, two hypertext sites were assigned for non-fiction readings with the task of writing a journal reflection about their reading process. Brown who considered her computer experience as at the beginning level, wrote in her journal about the sites recommended in the class:

"The one in the Syllabus Page is a good example, Writing Resources Center and Research Center. It provides the all basic information about writing effectively. Sometimes I have a wonderful idea about the assignment, but in turn it comes out a bore one because I don't know how to organize it. I bet this will help me improve my writing skill since it indirectly shows me the right track toward writing" (Brown, Journal # 5).

Since these selected non-fiction sites included only a few linear and/or non-linear links, students did not report any problems with following links, regardless of their computer experience. Students perceived non-fiction hypertext sites, which are linear in format, as a bank of information in which students could decide to accept, reject, or

discuss what is important for them and incorporate it into their writings.

Hypertext as a maze. The patterns in non-linear readings that were observed in the academic reading class and embedded in the data was best categorized as a metaphor, "Hypertext as a maze". Regardless of students' computer literacy level, students' perceptions and understanding of non-linear hypertext readings were as follows:

1. Non-linear hypertext readings were difficult to follow.
2. They were like a maze that would never end.
3. As a result, L2 readers' lack of schema about non-linearly presented hypertext caused navigational problems while accessing non-linear hypertext readings.

Most non-linear hypertext readings were in hyper-fiction and narration. In addition to fiction readings from the textbook, students were provided links to two non-linear fiction (hyper-fiction) in hypertext format (titled *Breeze* and *Under the Ashes*) for classroom reading. Two class hours were devoted to non-linear hyper-fiction readings and discussions on these readings. Students used the same set of questions for classroom discussions as for textbook reading discussions.

In an interview with Ned and Jennifer, both described their experiences with the program as trying to find their way through a maze. Although Jennifer liked to read fiction, she did not think that hyper-fiction was something that she wanted to engage in.

> I: Would you like to talk about the hyper-fictions we have done in the class?
> N: For me, I did like those readings. I think they are fun, but we click on many links that we do not have any idea where we are going. Reading becomes boring. But I cannot describe this.
> J: I felt like I was in a maze. I like to read, like fictions, but in the textbooks, stories in the textbooks I don't like...I thought I would never find the end (IN: Perceptions about hyper fiction: Ned, Jennifer).

All four students agreed that it was difficult to read hyper-fiction, because they did not perceive themselves in constructing their own story, at the center of the navigation and meaning-making process. In addition, these designs in hyper-fiction made them lose track of their reading process by literally leaving them "lost" in a maze.

For some students, this maze was endless. Trying to find at least one ending seemed to be the ultimate goal for students during the hyper-fiction reading. The instructional prompt consisted in the teacher's instructing the students to find at least one ending in order to write a character analysis. The instructional prompt provided the impetus to achieve that goal. Although more than one ending existed for the story, all students except Ned stopped reading after they found the first ending. Ned found the first ending to the story in the first five minutes, and then announced he was finished. The instructor urged him to continue and find the other endings, if any. Finding these endings to the story was not, however, a fast process for some. Linda, for example, focused on finding the ending while reading the hyper-fiction; at one point, she said she felt so impatient because it seemed the story would never end.

The endless maze created a situation in which L2 readers' lack of schema about non-linearly presented hypertext caused navigational problems when accessing non-linear hypertext readings. On the first day of the sixth week, Dr Beril talked about the characteristics of fiction. She stated that every reading had a purpose. She also wanted students to focus on plot, setting, and character. This instruction took about three minutes. Afterwards, Dr. Beril instructed students to open the Internet and go to the class web page to access the hyper-fiction reading, *Under the Ashes*. As students read through the hypertext fiction, the instructor stopped the class in the last three minutes of class time, and said that she wanted everybody to find at least one ending in the story, and write an analysis of the story. She also reminded students that they would have homework each week. This class ended on time.

After this session, students were asked to write a journal reflecting on their experiences with this first non-linear hypertext fiction. One of the initial questions was to find out whether students completed the task so that they could reflect upon their experiences. The journal responses showed clearly that students engaged in hyper-fiction readings, and that they followed the instructions for the task. In the following journal entry, for example, Adam described the character he found the most interesting:

> "In *Under the Ashes* the most interesting character to me was the little old woman, she seemed to have been the owner of the house and she used to hold a lot of parties but I think something or some people started bugging her so she must have burnt it or so" (Adam, Journal #7).

Although the students engaged in hyper-fiction readings, the experience was a new and

different one for them. Therefore, they were not yet able to understand the process. Rick, as an example, described the hyper-fiction readings as "strange":

> "It's different reading on-line because is new and an innovation for me. I really like this. Nevertheless, if the reading is too long it could be more exhaust than reading from books. I think the character in "Breeze" is very strange, because in this reading the protagonist is nothing and for this reason is very difficult to describe the characters. I like this reading but I can't describe this" (Rick, Journal #7).

As can be inferred from his reflection, he seemed to have been lost during the reading, and he confessed that it was a different reading experience for him. Rick's statement about the protagonist [being nothing] and his struggle to describe the character were important indicators of the navigational problems he encountered. Yet, it was difficult to come to this conclusion by looking only at the statement within the given context. Therefore, in the interview, I asked Rick about his statements:

> I: Would you like to talk about the hyper-fiction readings?
> R: They were strange, especially Breeze.
> I: Would you tell me more about it? Did you understand the content?
> R: Kind of, but I am not sure. There were links, and it was difficult to follow the story. I click a link, I read something, and I go somewhere else, and I forget what I have read.
> I: Do you mean you lost track of your reading?
> R: Exactly. I think it was not a good idea (IN: Perceptions about hyper-fiction readings: Rick).

For students in the academic reading class, non-linear hypertext readings were not easy to navigate. Students found themselves in a maze where they searched for strategies like making choices or finding an end to the story. However, regardless of students' computer literacy level, their understanding of non-linearly presented hypertext led to navigational problems for all of them.

Conclusion and Discussion

This study explored ESL students' understanding of and perceptions about hypertext readings in an academic reading context. Underlying these specific goals was the implicit goal of understanding and evaluating hypertext reading from a socio-cognitive perspective, as a literacy technology for ESL learners and as an instructional medium for educational purposes. Based on the findings in this study, students' understanding of hypertext was found to play an essential role in their approach and perceptions about the hypertext readings. They successfully benefited from this new environment by taking control of their reading process. On the other hand, they became disoriented and interrupted during the meaning-making process when they encountered a new genre or art form: hyper-fiction.

These findings supported the earlier research on reading hypertext literature in that background knowledge played a significant role in students' approach to hypertext (Chi, 1995, Altun, 2000). Students' understanding of hypertext and reading passages in hypertext resulted in either taking control of the process, or being disoriented in reading space. Different from the findings with experienced computer users (Altun, 2000), based on their prior knowledge and beliefs, L2 computer users could not develop strategies, which minimized disorientation and getting lost. One explanation of this might be the fact that the students in this study were less experienced computer users.

Also, the use of hypertext fiction in an academic reading and writing setting might have presented a new laboratory in which to test ideas; however, students did not seem to benefit from reading hypertext or reading with hypertext to clarify ideas of critical theory, as suggested by Landow (Landow, 1997). This finding might be due to students' lack of schema for and/or awareness of hypertext fiction. Such lack of awareness of hypertext fiction led L2 readers to follow various paths to find an end to the story. When clues were not present, they felt as if they were in a maze.

As far as literary hypertext fiction is concerned, this study supported the findings in Miall and Dobson (2001). Having looked at both linear and non-linear hypertext, Miall and Dobson (2001) reported that readers felt either confused during their reading, or felt that they must have missed something in contrast to the linear readers. L2 readers' schema on fiction, which suggested a beginning and an end, were not met in hypertext fiction. Therefore, they felt as if they were in a maze with endless loops.

On the other hand, hypertext fiction, interactive in nature, did not help L2 readers gain a sense of power in both reading and writing, as suggested by Moulthrop and Kaplan (1991). One possible reason for this can be the participants' background. This contrasting finding may also suggest hypertext fiction be considered a new form of

art (Becker, n.d.) and be evaluated within its own context.

The findings of this study suggest several implications for language educators. The first important educational implication that can be inferred from this study lies in the definition and practice of literacy education. Literacy has been considered equivalent to writing (e.g., Havelock, 1980), and thought the opposite of orality (e.g. Olson, 1994). However, with the introduction of hypertext technology, which includes various media, this traditional definition of literacy must be reexamined. In fact, in this study, ESL readers tended to access recorded materials in the hypertext environment. Literacy education must reflect this change, and insert changes in the hypertext technology into the literacy curricula. During this process, it will be the practitioners who will make the transition happen. Therefore, practitioner teachers should be provided guidance and time to disseminate these changes.

The second educational implication addresses the selection and the use of hypertext readings for classroom purposes. Language educators need to be selective in their choices, especially with hyper-fiction readings. Hyper-fiction represents a new genre or art form because it extends beyond traditional text. It is non-linear form, it does not follow a conventional linear fiction format, and it allows students, as Landow (1997) puts it, to not only interact with the text, but also to take part in creating a text of his/her own. Because the form is new, it proves to be problematic for students who are unfamiliar with the structure and procedure the hyper-fiction entails. It causes disorientation and prevents students from sharing, discussing, and negotiating meanings in a classroom setting. Due to this difficulty, students need to be trained separately when this new genre or art form is introduced into the classroom. If students cannot be properly trained in hyper-fiction, then its use in a freshman reading/writing class should probably be avoided.

Another educational implication is that the hypertext environment, especially the Internet, can provide a rich resource of information and a support tool for ESL readers to explore and obtain information to utilize for their needs. Compared to printed material, digitized information systems provide much quicker access to sources. Such convenience should not be overlooked, and the educational value of using hypertext and the Internet in classrooms to enrich the classroom environment for ESL learners is an issue that language educators must consider seriously.

The findings from this study also suggest the following issues need to be considered:

1. Hypertext readers should be introduced to various formats of hypertext readings before they are exposed to this new medium. As discussed earlier in detail, non-linear hypertext sites confused all students regardless of their computer literacy levels. When considering the hypertext readings for classroom purposes. Educators need to include supportive instructions to establish schema for these types of readings.

2. Readers in the hypertext environments should be exposed to various types of media during hypertext reading process (i.e., audio, video, text, and animation). The findings from this study showed that students displayed a tendency toward making use of any and all materials available to them. But when limitations were present in computer configurations, the situation caused students to experience problems in accessing audio and video sources over the Internet. Therefore,
   - Instructional use of these various types of media should be reconsidered and included into the curricula.
   - Hardware and software availability needs to be ensured.

3. It is important to note that neither computer nor text reading skills are alone an adequate basis to start using hypertext technology in language classrooms. New curricula and instructional techniques are needed when considering students' approach to this new medium.

Hypertext technology presents a new environment for students, a new tool for educators, and a new area to explore for researchers. The findings of this study bring up an emerging concern of selecting and utilizing hypertext readings for classroom purposes. If students are not ready for this type of reading, educators are advised to either develop schema-building activities or avoid using this new genre. For researchers, the implications, better designs and implementation of hypertext environments deserve a thorough exploration. In addition, hypertext use in classrooms needs to be examined with larger groups of participants from different vantage points to better understand students' approach to hypertext readings in language classrooms. To conclude, this is still a road, which is less traveled.

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Appendix A
URLs for the Selected Websites[1]

Week 2   Http://www.Webfeats.com/sealander/contents2.html
          Http://www.albany.edu/counseling_center/lonely.html
          Http://www.apa.org/monitor/mar96/solitude.html

Week 3   Http://is.rice.edu/~riddle/hyperfiction.old.html#honest
          Http://boards.excite.com/
          Http://www.jvd.net/rcl.htm

Week 4   Http://www.mindtools.com/
          Http://www.coun.uvic.ca/learn/program/hndouts/psq5r.html
          Http://karn.ohiolink.edu/~sg-ysu/writehb.html
          Http://www.researchpaper.com/
          Http://www.sonoma.edu/CTHINK/K12/k12library/helps.nclk
          Http://www.sonoma.edu/CTHINK/K12/k12class/Oconcept.nclk

Week 5   Http://www.delta.edu/~anburke/summary.html
          Http://karn.ohiolink.edu/~sg-ysu/sumwg.html

Week 6   Http://leo.stcloud.msus.edu/acadwrite/summary.html

Week 7   Http://sunset.backbone.olemiss.edu/~egjbp/comp/ad-claims.html

Week 9   Http://wwx.media3.net/plymouth/vtour/
          Http://dir.yahoo.com/Arts/Humanities/Literature/Countries__Cultures__
          and_Groups/

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[1] All URLs were active as of August, 2002.

Appendix B
Background Information Questionnaire

Please answer the following questions. All answers will completely be confidential. Thank you for your participation.

Gender: Male_____ Female_____ Age: _____

1. Identify your type of discipline and your position

2. How many years have you been using a computer?

3. Do you have access to a personal computer away from school? Yes _____, No_____

4. What type of operating system/platform do you use the most?

IBM/Windows_____,   Apple/Macintosh_____

5. How many hours do you access a computer in a day?

6. Do you use a computer or browser for scholarly reading (articles, reports, class work)?

7. Do you use a computer or word processor for scholarly writing and communication (letters, papers, reports, class work)?

___ Very Often   ___ Often   ___ Sometimes   ___ Rarely   ___ Never

8. What kinds of computer software are you accomplished using (you can check as many as possible)?

word-processing ___, spreadsheets ___, databases ___, graphics ___, games __, communications ____, other, please specify _____

9. Do you have a programming background?_____Yes   _____No

10. How familiar are you with computer technology? Please, check the appropriate correspondents, and add to the list if there is any NOT listed.

___ Word Processing ___ Internet ___ HTML programming ___ Java Programming
___ Visual Basic _____ C++

11. How would you consider your level of computer literacy?

_____Beginner   _____Intermediate   _____Advanced

12. Place the appropriate number (1 to 5) next to the activity which describes yourself.

 1. Daily   2. A few times a week   3. Once or twice a month   4. Rarely   5. Never

___ Use Email
___ View Newsnet groups
___ Write to Newsnet groups

How school troubles come home: The impact of homework on families of struggling learners

___ Write to Listserves
___ Read messages in Listserves
___ Use FTP (File Transfer Protocol) to receive or send materials
___ Use or view gophers
___ Use or view Web sites
___ Create an HTML (HyperText Markup Language) document (e.g., Webpage)
___ View electronic journal(s)
___ Other, please specify;

13. Do you use a computer browser (i.e., netscape) for leisure time reading (news, fiction, non-fiction, poetry, etc)

___ Very Often   ___ Often   ___ Sometimes   ___ Rarely   ___ Never

14. Do you encourage and support others to read electronically?

___ Yes   ___ No.

Any further comments: _____.

Appendix C
Interview Questions

Descriptive Questions:

Background Questions:

1. Tell me about yourself? Where are you from? How long have you been in the States, how long have you been learning English, etc.

Global Questions:

1. Do you like reading/writing? (I will ask some probing questions to elaborate the response).
2. Can you tell me how you prepare yourself for this course?
3. Suppose I want to improve my academic reading and writing skills, what would you recommend me to do?

Focused Questions:

1. I am doing a study about reading on-line in hypertext. You are the only (or one of the) student(s) with some computer experience in this class. How do you like studying on screen? Do you like reading in hypertext?
2. I am doing a study about reading on-line in hypertext. You are the only student in this class with no interest with reading hypertext? Would you tell me more about it?
3. I am doing a study about reading on-line in hypertext. You are the only student in the class who likes reading in hypertext. How do you like reading in hypertext environment?

Follow-Up Questions:

Probing and Specifying questions:

1. Could you say something more about that?
2. Can you give me a more detailed description of how you follow the links when you read? What effects your decisions?
3. What did you do then?
4. Did you notice whether you share what you read with your peers?

Direct and Indirect Questions:

1. Have you ever lost your way while reading online?
2. Do you recommend others to read on-line in hypertext?
3. What do you think reading and writing would be like in the next 5 or 10 years?

Interpreting Questions:

1. What do you mean by that?
2. What were you thinking when that happened?
3. Do you mean you just give up reading and writing when___happened?

How school troubles come home: The impact of homework on families of struggling learners

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