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MAPPING READING STRATEGIES IN AN ELECTRONIC EFL LEARNING ENVIRONMENT

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A minha angústia me corrige,
Meu sofrimento me corrige,
Minhas contradições me corrigem.

Brennand

ABSTRACT

MAPPING READING STRATEGIES IN AN ELECTRONIC EFL LEARNING ENVIRONMENT

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UNIVERSIDADE FEDERAL DE SANTA CATARINA
2002

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We are living in an age of profound changes in values and agenda, a reflex of society's paradigmatic shifts which include replacement of concepts, ideas, forms and functions in most areas of practices. These shifts include the construction of a new literacy paradigm which has been engineered with the burgeoning development of information technology. It is unquestionable the transformations occurred in the way we read and in the way we teach caused by the information technologies. This work describes an investigation aiming at mapping the reading strategies handled by Brazilian EFL students in an electronic environment and for instructional purposes. Two other issues were investigated, i.e. motivation enhancement and cognitive overloading. Twelve subjects from different fields at Federal University of Santa Catarina agreed to take part in the four-phased experiment that used a specially designed hypertextual unit about basic reading strategies. A think-aloud protocol, a questionnaire and the researcher's observations were used as data sources. The framework, designed to be used in computer simulated environments, was an adaptation made by Kauer and collaborators of Norman's seven stages model of interaction. The results and analysis of this survey showed the presence of 71 stages/strategies in a strongly marked decision-making process context. They also

suggested the subjects' perception of motivation enhancement with the use of a hypertextual platform. The current investigation searched some preliminary support to justify such a perception on an array of features such as cognitive learning styles, goals established, and domain expertise, among others. The analysis of the results have also demonstrated that the hypertextual format did not impose a high cognitive demand on the subjects. As a consequence no serious side effects like disorientation or a high level of frustration have been noticed.

186 pages

37 400 words

RESUMO

MAPEAMENTO DAS ESTRATÉGIAS DE LEITURA USADAS POR ALUNOS BRASILEIROS DE INGLÊS EM UM AMBIENTE ELETRÔNICO INSTRUCIONAL

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2002

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Esta pesquisa teve como objetivo principal fazer o mapeamento das estratégias de leitura utilizadas por alunos brasileiros de inglês em um ambiente eletrônico instrucional. Duas outras questões também fizeram parte da pesquisa, uma questionando se houve aumento de motivação com o uso do formato hipertextual. A perspectiva dos participantes da pesquisa foi o ponto de partida para tal análise. O outro questionamento girava em torno do aumento ou não da demanda cognitiva sobre os sujeitos devido ao uso da plataforma hipertextual. Doze sujeitos participaram do experimento o qual utilizou um aplicativo versando sobre estratégias básicas de leitura especialmente desenvolvido para esta pesquisa. Os resultados e a análise dos dados foram baseados na adaptação feita por Kauer e colaboradores (1999) do modelo de interação de sete estágios de Norman (1988). Um protocolo verbal, um questionário e as observações da pesquisadora foram os instrumentos utilizados para análise dos dados obtidos. Setenta e um estágios/estratégias foram identificados dentro de um contexto altamente decisório. A análise dos dados sugeriu que de acordo com a percepção dos participantes houve um aumento da motivação. A presente pesquisa buscou suporte para tal percepção em fatores tais como estilo de aprendizagem, objetivos estabelecidos, nível de competência de conteúdo e da interface, dentre outros.

Também não foi constatada sobrecarga cognitiva sobre os participantes devido ao uso do formato hipertextual. Como consequência, nenhum efeito colateral significativo, como desorientação ou frustração, ficou evidenciado.

186 páginas

37 400 palavras

CONTENTS

Page

LIST OF TABLES

Page

Table

LIST OF FIGURES

Figure Page

LIST OF GRAPHS

Graph Page

LIST OF APPENDICES

Appendix Page

CHAPTER 1

INTRODUCTION

1.0 Preliminaries

The burgeoning complexity of our society caused by the advances in computer technology and communications and the massive use of information technology has resulted in very sophisticated demands. One of them is the work with electronic reading/writing. No matter the still relatively embryonic research about the features of computer systems as a new medium of communication, it is undisputable the importance of such an interactive information structure and the astonishing speed with which it has been developing mainly over the last decade. As a consequence, our everyday life, our social life and our intellectual life have also undergone substantial changes in the past several years.

The new perspectives created in the reading and writing research fields, mainly in the last two decades, have brought with them crucial implications to the way text is dealt with by readers and authors, learners and teachers alike. Such new perspectives comprise the new literacy paradigm which is being engineered with the development of information technology. In this new paradigm some issues have been maintained, some added and some confronted. The present study considers one strand of such a paradigmatic shift.

The premise posed here is that this new literacy foregrounds some different reading features and strategies to approach the text. In order to investigate what

(basic) reading strategies Brazilian English as a foreign language (EFL) learners use when dealing with an electronic environment I will take hypertext as my point of entry.

In their discussion of an alternative for either the 'classical' technology- or user-centered approach and the technology-centered approach, De Greef and Neerincz (1995) put up a table with the three approaches towards system design that is reproduced in Table 1:

Table 1. De Greef and Neerincz's (1995, p.535) summary on designing aiding to human -system task performance

The design of cognitive support compared to the "classical" technology and user-centered approaches to system design

Approach	Focus	Impact on design
Technology-centered	Primary task	SE* models and methods
User-centered	Interaction tasks	HCI**-principles
Cognitive support	Joint execution of primary task	SE models and methods incorporating HCI-principles

* SE= Software engineering
** HCI= human-computer interaction

According to De Greef and Neerincz the user-centered system design focuses on the human task performance aiming at developing usability and learnability principles of software systems, stressing the communication between humans and computers; a preoccupation with a simple and consistent interactive relationship is of utmost importance in this approach. However, they point to some shortcomings of the approach, such as the impossibility for the user to always play the master role

("i.e. know which goals have to be performed or when they have to be performed" p. 533) and, probably as a consequence, "profit from the computer as much as possible" (p.533). Even assuming De Gref and Neerincz's partly justifiable criticisms of the user-centered approach, it is the perspective adopted in this research, as I believe it conforms to the degree of technological feasibility expectations of the present investigation.

Thus, the current study follows as much as possible the user-centered approach, that is advocated by Rouet and Tricot (1996). As they claim, such a perspective

> focuses on the interaction between a system and its users. It is concerned with the skills required to use the system and the effects of the system on people's activities. From this perspective, less attention is paid to the technical characteristics of the system unless the researcher wants to check the effects of one specific feature on the user, and more attention is spent on the problems users are likely to experience (p.4).

Turning back to the queries of this study, apart from the main investigation question, two other crucial related issues are tackled, namely the reader's underlying motivation while dealing with electronic reading, and the cognitive overload the searching demands electronic reading seems to presuppose. The questions posed in the present investigation are detailed in section 1.4.

1.1 Context of investigation

As we have been learning in recent years, the electronic text (hypertext) is characterised by a different array of features which go from the different format of representation till the multiplicity of perspectives through which it can be represented (Tergan, 1997; Intraitor, 2000). Today, the electronic text is the amalgamation of resources such as audio, video, animation, graphics and images. This multiplicity of perspectives makes an impact on the way information is displayed and brings in a new concept of text, writer and reader, as well as of the organised contexts they belong to (Landow, 1992; Lanham, 1993). In fact, what we are experiencing nowadays is literacy being reinvented. The following section presents some considerations on literacy from the vantage point of different researchers, focusing particularly on those perspectives concerned with the reading/writing on screen.

1.1.2 The new literacy

What are the requirements and representations involved in reading and writing nowadays? Both in traditional and electronic contexts it has been difficult to encounter a precise definition of what literacy is or what it should encompass. No doubt the term is clouded by relativistic ideological, economic and cultural slants that vary according to the context where it is being discussed, as Johnson-Eilola (1994) reminds us:

> [I]n using computer technologies such as hypertext, theorists and educators must remain alert to the pitfall that C.H. Knoblauch warns of in his essay on literacy and politics: definitions of literacy "only tell what some person or group — motivated by political commitments — wants or needs literacy to be". We cannot disable or remove the trap when we define and teach literacy — we must acknowledge and integrate it into our definitions as a way of promoting continual self-criticism (p.218).

To start with, it is unquestionable that literacy, as it is viewed currently, leaves far behind in the past the traditional conceptualisation of being literate, i.e. the ability to encode and decode written text. For many years, for example, the mere ability to write and read one's own name was the official criterion used by Brazilian educational policy makers to account for the level of literacy of the country. Nevertheless, if the official figures related to literacy rate increased, so did the statistics of people who were not able to deal with the overflow of information running through the door open with the literacy magic key. A new category of illiteracy comes out: the functional illiteracy. In such a situation, people can read and write but the acts of transferring are impaired. Things like using a map, a bus schedule, or a telling machine, filling in an application form, or giving information about one's social security card represent a real pain and a mystery. As bad as that, is the lack of ability to be selective and critical in relation to the information they get. With the introduction of information technology, things have exacerbated. If in traditional print era the canons used to dictate what was 'good' and 'bad', 'right' and 'wrong' in most areas of activities, information technologies provide for exactly the opposite. In other words, the centre is impermanent and movable, power tending to follow a centrifugal movement where everybody is, so to speak, a canon. Within such a context, credibility may be a questionable issue.

1.1.2.1 Identifying foundations

The issue of being literate these days has received considerable attention from researchers and educators concerned with reading and writing. Literacy, as it is viewed today, should be embedded in a broader context that calls for more than just knowing how to deal with technological devices. Such a broader view is based on tenets that stress cultural transmission as being directly related to human learning, and the crucial role dialogue has in the learning process, as posited by Vygotsky (1962, 1978, as cited in Drapper & Anderson, 1991) and Wertsch (1985). Thus, this broader context encompasses the products real reading and writing (electronically or not) should bring about, i.e. the capacity to inquire, to select, to choose, framed by the individual's own values and beliefs, and considering also the social context. It would provide for the creation of Vygotskyian *zones of proximal development*, or *bandwidths of competence* (Brown, 1997), or *zones of learnability* (Kintsch, 1998) both of individuals and of groups. Literacy in our contemporary world has to do with giving / receiving support to/from the joint-work role characteristic of transactional stances. Leu (2000) notes that

> literacy is essential to enable individuals, groups, and societies to access the best information in the shortest time to identify and solve the most important problems and then communicate this information to others. Accessing, evaluating information, solving problems, and communicating solutions are essential to success in this new era (p.746).

This view is in line with Pea's (1985). He posits that "[T]o know is no longer to have knowledge in one's own memory, but to be able to effectively search for, find and use the information one needs for particular purposes" (pp.176-177). From this vantage point, literacy should be concerned with developing the following aims, as Pea (1985, p. 117) outlines:

1. A new emphasis on cognitive skills of information management (Hawkins, Mawby, & Ghitman, in press), including problem posing/question definition (S.L. Bown & Walter, 1983), flexible strategies for information retrieval, information schematisation and inference, textual summarisation and intertextual integration.

2. A renewed emphasis on written communication and critical inquiry skills (e.g. evaluation of source of information and claims to knowledge).

3. Metacognitive and self-regulatory skills (A.L.Brown, 1978) such as planning ahead, comprehension monitoring (Wagoner, 1983), cognitive resource management or control (Scoenfeld, 1985b), and learning how to learn (Dansereau, 1985; Weinstein & Underwood, 1985).

4. Strategies for creative thinking and problem solving (e.g., brainstorming; problem decomposition; and proposing, testing and debugging approaches to a problem) and systematic decision-making methods (e.g. decompositional approaches to comparing utilities of choices, e.g. cost-benefit analysis) that crosscut knowledge domains.

5. Cooperative group problem solving (Slavin et al., 1985) and negotiation skills.

Negotiation skills that take the learner from 'personal ignorance' to 'public knowledge' (Wilson, 1977, as cited in Burnett & McKinley, 1998) are also included in the aims of the new literacy.

1.1.2.2 Computer literacy

Under this overarching view of literacy there is a narrower one, i.e. *computer literacy.* According to Maddux, Johnson and Willis (1997) the concept of computer literacy also offers ground for intense debate on, among other things, what knowledge or skills it should make up. In other words, "whether literacy should be learning about computers or learning how to use computers" (p.90).

Being literate these days means to have at least some kind of knowledge in dealing with certain new technologies our grandparents or even our parents would never imagine us to be required to, from the most trivial — choosing items from a supermarket list accessed via a domestic computer, to very sophisticated ones, like participating in real time of meetings and debates without leaving the office. The new literacy pattern also includes the minimum of abilities in dealing with a paraphernalia of electronic devices such as electronic dictionaries, photocopiers, scanners, etc. Even research has become more complex as we need skills in electronic modes and means, such as e-mailing, file transferring, newsgrouping and other forms of electronic interaction. In a narrow sense, this seems to be what computer literacy encompasses.

Bolter's (1991) definition of 'computer literacy' includes either computer operation or technical knowledge of programming and concepts of computer science

On the other hand, Beavis (1998) talks about 'literacies' and acknowledges the fact that "the new literacies need to include the capacity to 'read' and 'write' the new technologies, and to understand what is entailed in the operation, reception and production of their texts" (p.244). However, it is in Lemke (1997, as cited in Beavis,

1998) that one finds literacy being divested of its traditional notion of a single and overarching concept. According to him, there are "at least four new literacies that will be required in the age of new information technologies: multimedia authoring skills, multimedia critical analysis, cyberspace strategies and cyberspace navigation skills" (p.244). All of them will be a fundamental part of the new parameters of professional skills demanded in most occupations.

Finally, Lanham (1993) advocates that instead of providing for a technological education we should search the "generalised ability to manipulate symbolic reality [that] depends on precisely the rich signal of mixed word, sound, and image. (...) Teaching us how to live within this reality will be the job of a new kind of humanistic education" (p.229).

1.1.2.3 The new literacy and the educational expectations

What are the pledges of this new literacy in the educational scenario? Dryden (1994) emphasises three great expectations in relation to hypermedia:

> to empower students to become creators of knowledge and constructors of their own meaning; to reintegrate the fragmented departmentalised vision of knowledge that schools currently offer students; and to heal the cleavage Theodore Sizer perceives between the academic literacy of the schools and the broader "public literacy" practised by the rest of society (p. 284).

To what extent the promises of agency and reflection will be fulfilled in computer mediated learning contexts it is impossible to predict. As I see it,

electronic reading is involved in the four literacies pointed out by Lemke (1997, as cited in Beavis, 1998) one way or another. It is involved both in the individual work as well as in the joint-work with peers, teachers, and experts; in evaluative, selective and interpretative activities; in decision-making activities (relevance and adequacy of what to read); and in the architecture of strategies activities to avoid being lost in the cyberspace, for example. To a greater or lesser extent, these four literacies are closely related to the problem posed in the present investigation.

1.3 The study

An experiment was carried out using a prototype (Appendix C) developed to help map the strategies run through by Brazilian EFL students. The transcription of the subjects' verbal protocols elicited along the work with the prototype, a post-test questionnaire and the researcher's own observations provided the data for analysis.

The present investigation involved the development of a hypertextual prototype for instructional purposes. The reason for the development of a prototype was due to the non-availability of electronic teaching materials in conformity with the eligible English as a Specific Purposes (ESP) principles. Such an approach is the one underlying the tasks envisaged in the hypertextual application.

A post-test questionnaire, where the subjects presented their perception of the hypertextual format, was used in the experiment. The questions focused on issues such as: ease of use, level of satisfaction with the format, perceived length of time to solve the tasks, perceived usefulness to the reader and course, level of frustration, and other positive and negative feelings towards the format/application. In addition,

I believe that the analysis of the answers related to the subjects' perceptions could also provide interesting insights as far as the subjects' learning styles are concerned. Based on several studies, it is one of the underlying assumptions of this investigation that the participants' personality traits and learning styles might have some influence on the strategies chosen along the hypertextual application.

1.4 Research questions

The current research is about reading in an electronic instructional environment (hypertext). It aims at investigating the strategies constructed by Brazilian EFL learners when facing learning material for academic purposes in an electronic environment, and for instrumental purposes mainly. Cognitive and affective components aforementioned in the very specific area of reading were taken into consideration to form the basis of the main issue of the present study.

The main research question guiding this investigation was: What kind of strategies do Brazilian EFL learners use in order to face an electronic instructional reading environment?

Two further issues followed naturally from this main research question:

1. Is motivation enhanced with the use of a hypertext format?
2. Does the hypertext format cause a cognitive overload for an EFL non-expert user? What specific features contribute to such an overloading?

To address the second and third issues posed here I claim that affective factors (motivation, specifically) and cognitive factors (overloading, specifically) play a major role in the reader's choices of strategies, affecting performance when

he/she is reading on the screen. Indeed, the literature provides a stimulating discussion on the possibilities of increase in the level of engagement when there is a shift of focus of the student's role, from a spectator to an agent of his/her own reading acquisition process. This was expected to be reported by the participants of the experiment conducted in this investigation. On the other hand, an increasing body of evidence gives support for the assumption that there might be an additional cognitive overload for hypertext readers provided that they have little or no familiarity with hypertextual structures and navigational orientation, i.e. what to do, where to go, how to get there.

1.5 Value of the research

Computer-education courses have not assumed a significant presence in Brazil yet. While in developed countries a majority of schools are equipped with computers, using them for educational purposes or as educational instruments, in our country the use of computers is still relatively low, mainly in public schools. Despite the recent efforts of the government to provide public schools with technological resources we can say for sure that from a technological access perspective our educational system has a long way ahead.

In order to meet the celebrated possibilities of hypertextual instruction, at least three issues should be tackled. The first has to do with the setting up of educational policies that could enhance material access to technological resources. The second refers to cognitive issues, i.e. we have to be taught how to deal with those resources; and the third must consider the affective perspective, i.e.

hypertextual instruction has to be approached in such a way so as to create positive learning contexts that could help enhance the learners' confidence in the new medium. Thus, activities hypertextually formatted need to provide for purposeful activities on social, intellectual, academic and professional levels. In order to develop such activities, an understanding of how users interact with a hypertextual application is necessary. However, as Intraitor (2000) acknowledges, there is a shortage of "research being published in journals that explores the impact of technology on reading" (p.32). Therefore, the mapping of the user's steps in an electronic environment seem to be relevant and might contribute to the understanding of the issue, thus facilitating the development of purposeful activities and materials. Based on a view of learning which stresses individual / conjoint work, augmentation of self-pacing and self-regulation strategies, curricula and material design are the major areas in charge of providing for such urgent shifts.

With the tentative pursue of mapping the basic reading strategies used by Brazilian hypertext readers this study intends to contribute to the fostering of at least the last two mentioned issues. Thus, the strategies identified might hopefully:

- represent sources of scaffolding in the task of learning from text through the possibility of implementing connections between reading skills and the need to develop the students' autonomy to learn independently, as acknowledged by the 'Parâmetros Curriculares Nacionais' (PCNs);
- enhance independent thought, and help to augment the interactive processes between text and (Brazilian) EFL actors involved in the electronic learning environment, as well as promote critical thinking, problem solving, and decision-making;

- assist materials designers and teachers in the development of join-work tools that facilitate the reading comprehension process in electronic environments.

In addition, this study might also be viewed as a daring contribution in the debate about Brazilian educational practices in relation to the recent rapid changes which have taken place in educational technologies.

Finally, the importance of this study resides on its character of originality. Indeed, being an area drawing very recent attention in Brazil, no investigation, to this researcher's knowledge, has been undertaken with EFL hypertext readers up to the present time. Other studies related to strategies and hypertext (Folz, 1996; Dee-Luca, 1996) were carried out with L1 participants, with strategies playing a mediating role as regards the main focus of the research.

1.6 Overview of the dissertation

In this study so far, the focus has been mainly on the foundations of the new literacy, the new paradigm that conflates learning and technology with some brief considerations about theoretical sources that have influenced this analysis. The remainder of the dissertation is structured in the following way:

Chapter 2 consists of a review of a selection of the literature concerned with

- the re-conceptualisation of literacy;
- hypertext (and hardcopy contrastive features).
- Motivation, autonomy and the practised reader.

The review of literature is restricted to the authors who have somehow contributed to clarify the questions addressed in this study.

In chapter 3, the methodology used in the present study — the experiment carried out with a hypertext prototype — is presented.

In chapter 4, the results of the experiment are put forward and analysed keeping in mind the investigation questions. Chapter 5 consists of the results and analysis of the secondary issues posed here, and under the guidance of the pertinent literature.

Some conclusions, and limitations of the study and pedagogical implications are presented in chapter 6.

The Coda closes this work with some final considerations.

CHAPTER II

REVIEW OF LITERATURE

2.0 Introduction

In an attempt to inform our understanding on this new literacy paradigm, and bring some light to the main issue pursued in this investigation , i.e. the mapping of reading strategies in an electronic EFL learning environment, this section devotes some space to a brief historical overview of hypertext, its characteristics, advantages, disadvantages, and contrasting features in relation to hardcopy.

This section also includes a review of the literature of issues that pervade the new literacy paradigm and that are intrinsically related, such as strategic knowledge, cognitive overload, motivation, and autonomy.

2.1 Hardcopy reading

The field of reading has received a great amount of attention over the last twenty years. Historically considered a passive and "secondary" skill, reading has undergone a significant shift, achieving a core status along the seventies and eighties. Undoubtedly, it has become the main focus of attention of several second language reading researchers, EFL/ESL teachers, material designers and, more recently, policy makers. EFL students have also become aware of its importance as a study skill as it has a strong effect on their academic performance and, later on, on their occupational performance as well. In other words, they realised that without

effective reading comprehension strategies they would not be able to cope adequately with their academic and professional demands.

On several different moments of his 1981 work, F. Smith comments on the multiplicity of meanings reading encompasses. Thus, they vary from *...understanding the authors thoughts*, through *...understanding printing*, *...receiving communication*, to ... *extracting information from text.*

Obviously, as Smith postulates, there are many other ways of viewing and defining reading. His own definition of reading, apparently simplistic, seems to be, in a way, very comprehensive and effective. For him, "reading is asking questions and getting your questions answered" (p.105). The asking / answering feature presupposes personal engagement, interest, motivation, and comprehension. In this manner, being able to generate [relevant] questions about a text implies that we are halfway towards its full comprehension; and being able to answer those questions implies that the text is likely to have been (totally) comprehended. Relevance, appropriateness and prediction are key concepts at this point.

It is important to notice that the "appropriate or relevant" questions asked (explicitly or implicitly), the way text is approached, one's commitment to it has to do, as Smith claims, with the background knowledge one has in relation to the topic focused. Research into the area of reading has been very much concerned with the issue of background knowledge — how to acquire it and how "to make it instrumental", in Boekaerts' (1997) terms, in order to enhance the reading activity. This instrumentality, important to motivation and learning in traditional printed material, equally plays a fundamental role in relation to electronic environments. It has to do with the use of adequate strategies and techniques for connecting facts to

each other, thus helping learners to think critically, as well as the necessary familiarity to navigate purposefully, thus helping learners to avoid being lost in hyperspace.

The strengthening of the interest about the mental processes related to reading comprehension has made it a fruitful research area. This has been evidenced by the considerable amount of studies conducted in the last two or three decades, mainly, as well as the various models of reading put forward aiming at trying to analyse and understand the mental processes involved in reading comprehension. However, much of this body of research was related to conventional hardcopy medium. With the introduction and development of information technologies, and their integration in the instructional environment, there occurred a new surge of interest in the way texts are approached electronically.

2.2 The electronic environment

By and large, the still growing body of research concerned with learning in electronic environments could be grouped into three categories: those studies related to the assessment of usability of hypertext systems; those referring to the design of media evaluation studies; and those regarding the role and effectiveness of resources to support learning environments. The confluence of technical feasibility and cognitive research apparently envisaged in the last category mentioned above might be encompassed by new literacy approaches whose tenets put learning as a personal process based on one's own peculiarities, and where the building of knowledge and

understanding is individual and incremental. This is also the locus where I would like to situate the present study.

Underlying the binomial developmental view of learning / in-general multimedia applications there is the notion of 'cognitively authentic learning experiences'. According to Squires and Preece (1999), a review of the pertinent literature indicates authenticity as leading to the concepts of credibility, complexity, and ownership. Thus, interactive multimedia applications (summarised below) give learners the opportunity to

- test the credibility of an environment by means of simulations of the system's behaviour and the feedback on the learner's action on the system, environment or artefacts;
- express personal ideas and opinions, with the environment providing a mechanism for the articulation of these ideas;
- experiment with new ideas and try out different solutions to problems;
- face complex situations by the use of strategies such as scaffolding, anchoring, and problem based environments;
- get a sense of ownership that is related to learners taking responsibility for their own learning (p. 469).

It is worthwhile to note that notwithstanding the deep interest of the present investigation in notions like the ones above that embrace motivation, autonomy, and joint work, the prototype designed to identify reading strategies in an electronic environment used here did not allow for much of the interactivity required in complex, ill-structured[1] software, as it is assumed in Preece and Squires' discussion.

[1] Ill-structured: non-hierearchically arranged; having more than one entry point and more than one exit point.

2.2.1 Hypertext: Back to basics

The word 'hypertext' was coined in 1965 by Ted Nelson. However, the concept of networks of information in the form of texts, graphics, video, and sound was known as far back as the mid-1940s when Vannevar Bush, President Roosevelt's Science Adviser, wrote an article where he predicted a machine that could help scholars and decision makers organise and retrieve information by the use of links between texts or parts of texts (Delany & Landow, 1991; Shneiderman, 1998a, Intrator, 2000; Patterson, 2000). Among the innumerable features predicted in Bush's device (called "memex", or memory extender), the following are mentioned in the literature as outstanding:

- storage capacity of a person's information, from books to other textual material, such as pictures, records, letters, and so on;
- speed and flexibility of retrieval by following the way human minds work, i.e. by making associations from one node into another ("associative indexing", "links") (Seyer, 1991; Evans, 1993);
- trails on links;
- capacity for annotation, with the introduction of the concept of customisable text (Landow, 1992).

Despite its relative novelty, the legacy of hypertext is very impressive. Landow (1992, 1994) acknowledges the presence of key concepts of critics and philosophers influencing the architecture of the underlying nature of hypertextual theory and practice, such as Barthes' *ideal textuality*; characterised by reversibility, non-canonical and diverse accessibility; Derrida's *text openness*: *de-centerable / re-*

centerable system; Kristeva's *intertextuality*; Bakthin's *multivocality*; McLuhan's ideas on *collaborative practices* of electronic information technology in general *(global village)*; and Foulcault's *conception of networks of power* (also mentioned in Roth, 1992; Gergen, 1994; Burnett & McKinley, 1998). All of them, as Landow (1992) comments, "argue that we must abandon conceptual systems founded upon ideas of centre, margin, hyerarchy, and linearity and replace them with one of multilinearity, nodes, links, and networks" (p. 2).

Finally, Liestøl (1994) and Burnett and McKinley (1998) find common grounds between hypertext and Wittgenstein's *ambiguity of language,* and *rejection of linear argument.* Wiitgenstein (1953) suggests that the meaning of a concept is not fixed as it depends on issues like individual goals, experience, and context. Therefore, any agreement between two people may be a fallacy. In respect to Wittggenstein's view of language, Drapper and Anderson (1991) attempt a juxtaposition to Vygostky's understanding of the role of social interaction in conceptual development. Their conclusion evidences non-idealisation as a crucial aspect in the process of understanding the world and consequently foregrounds the role of negotiation among the several elements involved in the construction, transmission and interpretation of language. In other words, as Drapper and Anderson posit, "what is culturally transmitted is not "in" what is said in the sense of a message being decoded by the child" (p. 96) but exactly in the trade offs of meaning.

2.2.2 The quest for an identity

A problem usually acknowledged by researchers (McKnight, 1996; Ess, 1994; Bolter, 1991) refers to the lack of a consensus on what a hypertext is or should encompass. Thus, the concept of hypertext means different things, and encompasses different problems, to different people. According to McKnight,

> [T]he term hypertext does not refer to a unitary concept. When comparisons are said to be made between hypertext and paper documents they are said to be made between certain implementations of hypertext and standard versions of paper texts. Each implementation consists of one designer's (or group of designers') ideas about how to build the interface between users and information (p. 233).

This 'definitional diversity' is also pointed out by Ess (1994) who asserts that such a lack of definitional clarity is an evidence of the fluidity of the medium caused both by continuing technological progress, and by the atheoretical character of much work on hypertext.

Evans (1993) also attempts to clarify what hypertext consists of. As he puts it, linking units ("nodes") of text represent the basic principle upon which hypertext is built, and connectivity is pointed out as its distinguishing feature. He draws attention to the way the links of a node are connected to different nodes by means of several other links thus composing a file that may be accessed randomly according to the user. The progress on this basic principle and operation is that the nodes can be made up of sound, graphics or film. However, as he adds, "the term *hypermedia* is normally used as a generic reference and *hypertext* continues to be used to allude to specific programs" (p. 214).

Kumbruck's (1998) view of hypertext implies decenteredness, empowerment and text flexibility. She observes that the term refers to "a reading approach that is not regarded as determined by the writer" (p.166). Thus, as she points out, although very vaguely defined, the term suggests no predefined structure, with readers compiling their paths interactively. Reader's control is augmented. A second feature suggested by the term is that the textual base and its links can be changed, for instance, with the inclusion of annotations, or by electronic cuttings of the text that are then copied into the user's own text or file.

On this flexibility assigned to hypertext, Lanham (1993) makes the following comment:

> The interactive reader of the electronic word incarnates the responsive reader of whom we make so much. Electronic readers can do all the things that are claimed for them — or choose not to do them. They can genuflect before the text or spit on its altar, add to a text or subtract from it, rearrange it, revise it, suffuse it with commentary (p. 6).

Viewed this way, the reading (and writing) process seems to be referring to a different mode of interaction between reader and text, certainly not the one characterised by Davies (1995) as 'private' and non-observable, and referred to by Leu and Reinking (1996) as internal interactive processes. Reading electronically has as a distinguishing feature the trade off between the reader and the interface, or between the reader and other readers. In other words, there is a permanent externally oriented negotiation aiming at transforming personal ignorance into

individual, or public knowledge. The sense of closure and distance imposed by print do not find resonance in the electronic environment.

Without dismissing the *Rumelhartian* model of understanding the reading process, which seems to be Davies' vantage point, the electronic environments are very much concerned with external interactive and responsive processes in which the electronic reading/writing very often transforms the processing of information in an on line, public, tertiary source product. What is called 'external' here might daringly be associated to Ong's (1982) claim of outwardness of secondary orality, i.e that one characterised by greater focus on collaboration and sharing, decreased emphasis on personal privacy, and on what private ownership of words means. According to him,

> [U]nlike members of a primary oral culture, who are turned outward because they have had little occasion to turn inward, we are turned outward because we have turned inward. In a like vein, where primary orality promotes sponeity because the analytic reflectiveness implemented by writing is unavailable, secondary orality promotes spontaneity because through analytic reflection we have decided that spontaneity is a good thing (p. 137).

Thus, seen from this standpoint the process of reading and responding to a writer *is* directly observable. It provides for *co-authoring, customisation, and collaboration* (as each reader choses his/her own alternate paths, might add his/her own notes, or might produce immediate supportive or contradictory responses).

From this we can assume that the learner's degree of control and interactivity is raised and the writer's control is lessened. This view is also advocated by Landow (1992) when he observes that, in hypertext, the writer loses a certain basic control

over his text, particularly over its edges and borders. It is, no doubt, a very interesting reconfiguration of power which he sees under a crucial political perspective. In fact, the decentering caused by the possibility of starting or continuing to read from different posts assigns power to the user both in micro and macro levels. One of the consequences, he asserts, would be the tendency for canonical texts to lose grounds. As literature is one of the means used to give birth to dichotomies such as dominance/dominated among societies, a new revolution may be on the way. Gains in control in hypermedia environments have also been reported by Lepper and his research group; Becker and Dwyer (1994, as cited in Kamil, Intrator & Kim, 2000), and also reviewed by Leu (2000).

Another perspective by which the issue of control could be viewed lies in the debate on how much control one should have on his/her own learning in electronic instructional environments. In Canelos, Dwyer, Taylor, Belland, and Baker's (1989) study, for instance, they review research on self-paced instructional models versus externally paced delivery strategies. Thus, the central issue is the questioning put forward by Carrier (1984, as cited in Canelos & colleagues, 1989) on "the validity of allowing students to exercise their own judgements about how much instruction they need and in what order" (p. 303). The view of authors like Wittrock (1979) and Travers (1972) both also cited in Canelos and collaborators, was that

> self-pacing may not be the most effective delivery strategy for all instructional and learning conditions because self-pacing may reduce the attention and motivation levels below those necessary for effective interaction with the content material (302).

This conclusion was also supported by Belland and colleagues in the same study according to whom "moderate levels of external pacing of microcomputer-based instruction may be more effective than completely self-paced microcomputer-based instruction in facilitating student achievement of complex concept learning and free recall of spacial problems" (p. 302).

Addressing a similar issue, this time related to the effect of hypertextual environments on reading, Charney (1994) speculates whether readers' are able to "make appropriate selections of what and how much to read", and to "create appropriate sequences of textual material" (p.250). This kind of dilemma seems to be of the same nature of other crucial issues that affect our political space, such as how much freedom such press have, what is public and what is private, individual rights, or capacity to vote 'correctly'. Those issues are certainly related to power.

2.2.3 Hardcopy and Hypertext: some defining features

The literature on hypertext emphasises requisites that contrast with those of the traditional approach to reading and writing. Fowler (1994a, as cited in Baron, 1997) puts forward some hardcopy characteristics which I have here contrasted with hypertext features. It is worth noting that what is shown are those outstanding characteristics pointed out by the literature whenever the issue under consideration is the comparison/contrast between hardcopy and hypertext. It does not mean, whatsoever, that a hardcopy could not be handled in a non-linear way, for example, or that an electronic text could not be read linearly. As Snyder (1998) asserts,

> [S]uch features appear to constitute the generic characteristics of hypertext, but it is as difficult to talk of 'generic' hypertext as to talk of generic print. Nor all printed texts appear in books, for instance, nor for that matter as literature (p.127).

By *linear* reading I follow Reed, Oughton, Ayersman, Ervin, and Giessler's (2000) view according to which linear steps have to do with "the next logical, sequentially forward movement" (p.6) whereas *non-linear* steps refer to any other type of random movement (backwards, jumps to the menu, forward but not sequentially, etc.). The issue of hypertext 'defining features' is also discussed by Jonhson-Eilola (1994) who states:

> A key difference between hypertext and linear text is the degree to which hypertext readers are allowed to choose from multiple paths through a body of text. A text is hypertextual not because it was written in any specific computer program but because it follows this general theory of textual structure: readers do not read top to bottom across a page and front to back from page to page, but according to a path they navigate through a network of text nodes (p.197).

Some of the most outstanding features of hypertext found in the literature are summarised and contrasted to traditional printed material in Table 2:

Table 2. Hypertext and hardcopy contrasting features

	Hypertext	Hardcopy
1	Multiple authorship: blurring distinction between author and reader	Authors can be distinguished from readers
2	Text as a property of authors and co-authors (readers)	A text is a property of its authors
3	Text is changeable: Unstable, non-unified, non-linear texts	A text is (or should be) fixed, unchanged, unified and coherent
4	Text decentredness	The centre of a text, of a group of texts or of anything else, is fixed, stable and single
5	Not one text, but several embedded texts	A text should speak with a single, clear voice
6	Text with a non-sequential body	A text has a beginning and an ending, margins, an inside and an outside
7	Discontinuity: text with a non-hierarchical structure	A text is (or should be) clearly organised in a linear, hierarchical structure
8	Text as an interactive tool	Generally speaking, an author writes by himself and a reader reads by himself

However, it is Patterson (2000) that best pinpoints the difference between hypertext and printed material. It is a question of "attitude that readers bring to hypertext and other electronic texts than in any difference in the text itself" (p. 75). Indeed, we have been used to approach texts in a certain way and it may be difficult to change. This is certainly more difficult if we are talking about the 'pre-Nintendo' generation. Selwyn (1997) claims that little research has been undertaken in relation to students' attitudes towards computers, a topic that should interest educators and researchers alike.

2.2.4 Hypertext and hardcopy: Advantages and disadvantages

The potential of hypertext in education has been celebrated to a great extent by many researchers and developers, since it has become in fashion in the eighties. What has made hypertext so attractive, mainly among educators, seems to have been much more than just the novelty of a technological reading/writing tool. It has been related to the *possibilities* of using this innovation to enhance the way we deal with information — from the capacity to easily access information, accommodate data in just one 'big chunk', assemble these data in different ways, make connections with other correlated bits of information, to the addition of the reader's own contributions and, finally, to the retrieval of what has been stored / changed / juxtaposed. All that in a very tangible and quick manner.

Notwithstanding those advantageous general claims, hypertext does not represent a consensus. Some drawbacks have been pointed out, mainly by scholars, as for reading extensively on the screen. Thus, considerable eye strain and the fatigue of sitting in one position, discomfort and inefficiency with scanning by scrolling through a document on screen have been some of the physical problem complaints. Another drawback refers to disorientation in the hyperspace. Conklin (1987, as cited in Heller, 1990) recognises two kinds of disorientation, a simple one related to finding where you are in the system; and a second one, more difficult to face, has to do with discovering "how to get somewhere else in the system that you know, or think you know, to exist" (p.433). P. Smith (1996) encompasses Conklin's twofold definition in just one. For him, 'being lost' means the user's impossibility "to locate information which they require and which exists in the system" (p. 366).

The combination of efficiency and efficacy generally assigned to hypertext does not seem to be viewed as positively by some theoreticians/philosophers either. For instance, Lyotard (1984, as cited in Landow, 1992) refers to computing and information technology as 'prosthetic aids' used to satisfy the principle of optimal performance: "maximising output (the information or modifications obtained) and minimising input (the energy expended in the process)" (p.170).

In defence of technology in general and of hypertext in particular, Landow (1992) comments on the peculiar use of the word *prosthesis* used by Lyotard, and compares its meaning in Latin ("implies little more than an addition") to modern application which implies the individual's need for an artificial replacement for a missing body part due to birth defect or any catastrophic occurrence, restoring, this way, some capacity or power. Thus, his conclusion is that the empowerment hypertext brings about is a political issue and may cause a feeling of resentment among some groups in society. In his opinion,

> Lyotard's not uncommon use of this term to describe all technology suggests a powerful complex of emotional and political justifications for technology and its promises of empowerment. Transferring the term prosthesis from the field of rehabilitation (itself an intriguing term) gathers a fascinating, appalling congeries of emotion and need that accurately conveys the attitudes contemporary academics and intellectuals in the humanities hold towards technology (p.170).

I believe it to be somewhat naive to think of hypertext as a remedy to learning troubled waters, mainly when researchers report on disorientation and overloading as its possible side effects. It is also illusory to think that simply adding non-linear structures and multimedia devices will produce a flexible, usable and effective

learning tool. Nevertheless, it is inevitable not to welcome hypertext for some of its intrinsic and very much valid aspects, such as inclusiveness, retrieval, typographical facilities, capability of animation, polyvocality, etc. One of its most outstanding features, though, as postulated by Landow (1992) is connectivity. Such connectivity opens space to a joint work between learner-text, learner-peer students, and learner-teacher. Thus, the possibility of adding notes to the original text, for example, augments interaction between reader and text. In like fashion, interaction also occurs with the exchange of ideas among peers, or between learner and teacher. Both face-to-face in-classroom activities and in-home computer mediated supplemented activities may provide for the creation of both private and public knowledge.

2.2.5 The hypertextual format

Philosophical queries about hypertextual reading have concerned many researchers and teachers (Bolter, 1991; Landow, 1989, 1992, 1994; Lanham, 1993), in some of them with a trend to establish dichotomous relations. The different literatures concerned with hypertext and how it impacts reading have extensively discussed issues like positive and negative effects of hypertext on reading, novice vs. expert performance in electronic environments, linear versus non-linear text features, etc. (Kumbruck, 1998; Hoogeveen, 1997; Winkelman, 1995; Letho et al., 1995). Alternatively, Leu (2000) claims that only a small number of empirical studies of the cognitive consequences of reading this type of nontraditional text have come out recently.

This is also valid in relation to the examination of the use of strategies by hypertextual readers. Although some work could be located on search strategies in novice hypertext users, as reported by Rouet and Tricot (1996), and on reading strategies (Foltz,1996; Goldman,1996; and Beavis, 1998), the literature is still very incipient in relation to the mapping of the reading strategies performed by hypertext users. Indeed, as Reed and collaborators have pointed out, computer research is still very much concerned with global perspectives, leaving microlevel elements a little bit aside. In my view, strategies and items affecting/affected by their choices, like overload and motivation, might be included as some of those neglected microlevel variables.

Considerations on the strategic knowledge (following Paris, Lipson and Wixson's (1983) terms), necessary in electronic environments, have received little attention. Corroborating Reed and collegues, given that instructional computing is a relatively new area, educational practitioners are still cautiously touching the terrain, collecting data by observing what electronic reading embodies and demands in real life electronic situations.

2.3 Strategic knowledge

Several studies have documented the importance of the use of *strategies* in reading comprehension, specially in hardcopy. As acknowledged by Lorch, Klusewitz and Lorch (1995), the term *strategy* gets different meanings according to the different theorists that employ it. Thus, it could refer to the *systematic processing principles*, or *adaptations*, or *adjustments,* that readers make in order

to respond effectively to the demands of different reading situations. Davies (1995) reports on the debate found in the printed literature as whether the term strategy refers both to conscious and unconscious behaviour. The definition she puts forward seems to resolve such a controversy. As she postulates, "a strategy is a physical or mental action used consciously or unconsciously with the intention of facilitating text comprehension and/or learning" (p.50). Oxford (1989) has integrated the different strategies of good language learners in a 'strategy system' composed of six items that have been summarised below:

- *metacognitive strategies* (eg. paying attention, self-evaluating, and self-monitoring).
- *affective strategies* (e.g. anxiety reduction and self-encouragement).
- *social strategies* (e.g. asking questions and becoming culturally aware).
- *memory strategies* (e.g. such as grouping, imagery, and structured review).
- *cognitive strategies* (e.g. practicing naturalistically, analysing contrastively, and summarising).
- *compensatory strategies* (e.g. guessing meanings intelligently and using synonyms or other production tricks when the precise expression is unknown).

Although her system refers specifically to hardcopy (EFL teaching and learning), it seems to be extremely pertinent to the electronic context too.

For the purposes of this study, the term *strategy* follows Sutcliffe and Ennis' (1998) definition, according to whom strategies "represent the user's information searching skills" (p. 322). By *information searching* they refer to "a range of behaviours from goal directed information searching to more exploratory information browsing" (p. 325). Referring to the same notion, Burnett and McKinley

(1998) use the expression *information seeking* and define it more elaborately as a "complex, constructive process of sense-making intricately connected to the processes of inquiry and learning" (p.287). This process is characterised by Wilson (1977, as cited in Burnett & McKinley, 1998) as the "negotiation between the 'personal ignorance' of the inquirer and 'public knowledge', where 'public knowledge' is defined as the best view of the world that we can collectively construct at a given time" (p. 287).

The theory of learning underlying information seeking is based on assumptions like the following:

- learning is a complex activity;
- it is learner-oriented;
- it is incremental and relativistic;
- it presupposes a continuum;
- the scaffolding and organisation of information constructs knowledge.

The continuum from personal ignorance to public knowledge, i.e. to the building of expertise, though, presupposes an intermediate stage, the *private* knowledge stage, formed by the individual learning efforts in the construction of knowledge. As Burnett and McKinley (1998) argue, "[W]hen an individual seeks information, he or she does so with the intent of either transforming an instance of personal ignorance into private knowledge, or validating an instance of private knowledge" (p.288).

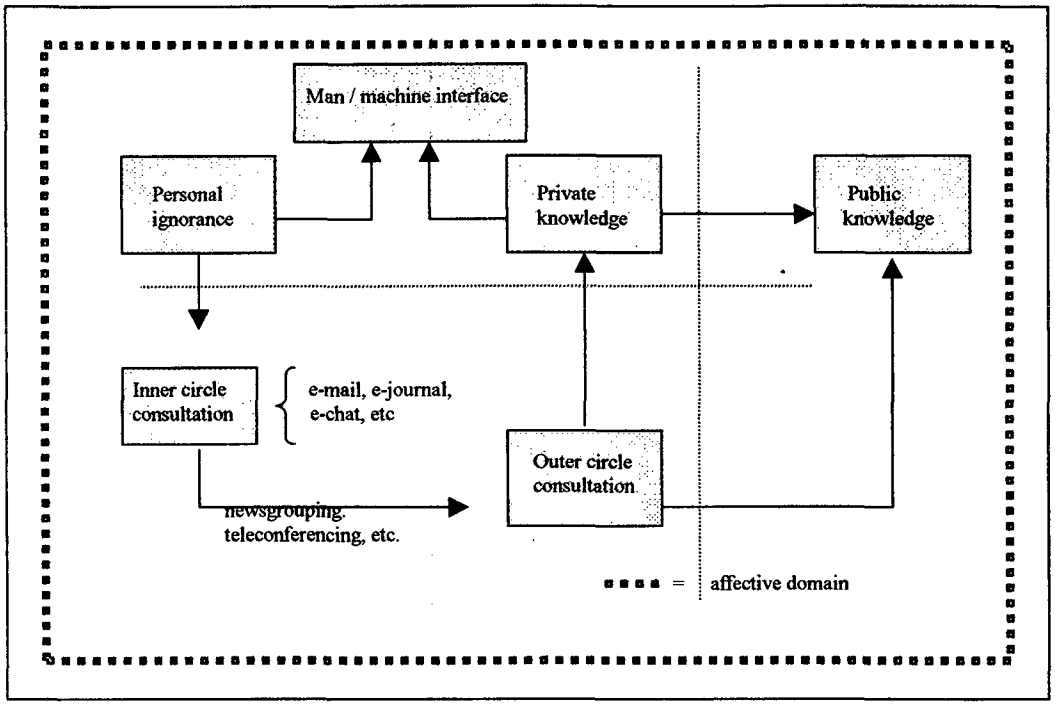
Leu and Reinking (1996) recognise the importance of strategic knowledge and criticise how uncontrolled it goes in software experimental studies. They also recommend the utilisation of Paris, Lipson and Wixson's three types of strategic

knowledge not only when macro level issues are focused (navigational and interface issues) but also on the micro-level (strategic decisions on the word, sentence, or paragraph levels). They add that no studies can be found on "the relationship between these micro-level decisions and graphic-, video-, or audio-based information" (p.56). Their assumption is that strategic processing may be different when electronic environments contain these information sources, especially when they appear in combination with written prose. Gillingham (1996) corroborates the importance of strategic knowledge when he claims that "[S]imply providing appropriate strategies is not enough if readers do not know when and how to use them" (p.95).

As far as the use of strategies by readers of both linear and non linear texts are concerned, Rouet and Levonen (1996), for example, argue that "hypertext involves specific reading strategies, due to its computer-based and non linear format" (p.5). Foltz (1996), on the other hand, reports on the findings about the few differences between hypertext and linear text and the readers' strategies as regards the maintenance of cohesion. Such strategies, he remarks, depend greatly on the navigational mechanisms provided in the hypertext as well as the goals of the reader.

A tentative schematic learning model (Table 3) is put forward describing the steps a learner goes through in his/her attempts to move from private ignorance to public knowledge. In the model the stages are computer-mediated. It accounts for asynchronous and synchronous user-machine interactions to learning construction without losing sight of the affective domain. By interaction I mean the actions (computer mediated or not, in real time or not) attempted to bring people together, or an individual user and his/her machine, in a context of trade offs.

Figure 1. Learning construction model within an electronic environment



The model I present in Figure 1 borrows from the ITOL (Information Technology-based Open Learning) model described by Lewis (1993) and also from concepts discussed by Burnett and McKinley (1999).

Thus, when a reader finds an unknown word, for example, he/she attempts a private solution, such as the use of contextual guessing, cognates, background knowledge, key words, etc. If the problem persists, the reader may ask a friend or his/her teacher (inner circle), or go further and consult a specialist (outer circle). There is a clear dialogical assumption underlying this model.

Common sense indicates that individuals learn best when they are in groups. However, there seems to be some controversy as far as interactional work is concerned. R.Lewis (1993) has pointed out two essential features required for peer interactive learning work effectively. The first has to do with motivation: to work

interactively may require some requirements involving, for instance, the proper preparation in terms of social and cognitive aspects. Thus, the goals must be seen as belonging to the group; on the other hand, the nature of the task has to be changed from individually-based to cooperatively-based so that learners can view co-joint knowledge construction and exchange as relevant and motivating.

Not much has come through the literature yet to determine generalisability as for the differencial effectiveness of the learning experience when electronic reading is gone through individually or in small groups. My main concern here, therefore, is with the asynchronous use of a learning material by individuals on their own, according to their needs, time and place conveniences, and respecting their learning styles, to exploit the potential of the school-home link.

R. Lewis (1993) advocates some advantages to the asynchronous mode of communication, such as non-invasiveness ("how often does the phone ring as just the wrong moment?"), patience ("how often do you phone someone and find that they are not there?"), and time-pacing ("the respondent has time to think about the best reply to the question posed") (p.176). This 'timing' requirement just mentioned is corroborated by Mayes and Fowler (1999) as they regard asynchronous communication as "particularly effective in fostering reflective learning" (p.494).

Although acknowledging the importance of realtime dialogue among people (computer-mediated or not) in learning situations, for my present purpose I will concentrate on the first part of the schematic model presented in Table 3, namely, that one concerned with the individual asynchronous interaction user-machine for the construction of *private knowledge*. Moreover, it could be argued, as Drapper

and Anderson (1991) do, that the computer is a participant of this sort of interaction as it

> issues prompts, provides feedback to the pupils' responses and so on, and its behaviours are (to some extent) codable in the same terms as the pupil-pupil dialogue, resulting in a complex multi-way interaction with each other and jointly and / or separately interacting with the computer (p. 97).

Notwithstanding the focus on man-machine interactions, the application (hypertextual prototype) does offer the possibility of extending those interactions to the inner circle to promote dialogical joint work activities by means of e-mail.

2.4 Coherence

The transformation of personal ignorance into private/public knowledge implies the use of strategic knowledge, as has been explained previously. Coherence could be viewed as a critical component to the construction of such a strategic knowledge. The necessity to construct coherent wholes is as old as mankind and its pursue has tormented philosophers, scientists, and politicians, as well as challenged writers and readers.

Thus, the establishment and maintenance of coherence is one of the premises for the personal knowledge to be accomplished. It finds support in different kinds of literature and world views, including the post-modern one, characterised by the favouring of multiple identities. To illustrate, according to Gergen and Gergen (1984, as cited in Burnett & McKinley, 1998) *hypernarratives*[1] represent strives of

[1] Hypernarratives = multiple, processual narratives

individuals to weave together disparate ideas derived from social interchanges. These social interchanges involve "a negotiation process in which participants propose, adjust, and interweave narratives" (p. 292) with the purpose of making sense of his/her own identity. This weaving feature may represent a strategic search for coherence and has much to do with the hypertextual concept and the search for consistency and order. In fact, coherence is one of our mental mechanisms to help 'make sense'of ourselves, of the others with whom we relate and with the world around us.

The attempts to establish and maintain coherence were interpreted in the present investigation as a general strategy used by the subjects to impose order on the apparently chaotic or unstructured patterns of the hypertextual format. It may be defined as what causes the text to stick together or provide it with a logical consistency. Although some work has been conducted on how coherence is constructed and maintained in an electronic environment it could be said that the area is still very incipient in terms of conclusive results. In fact, most of what is known comes from research on traditional reading.

2.4.1 Some features of coherence

Coherence seems to be made up of a wide array of features that are constantly interacting and updating and its establishment and maintenance vary from person to person and within a person. It depends on global and local connections, that are created and sustained in order to explain text meaning, and it is as volatile as the standpoints from which it may be spotted.

The different amount of features necessary for coherence to be established and maintained both in traditional and electronic reading environments depends on within-the-text organisation of information features, the reader's/user's micro strategies, a product of his/her negotiations with the text features, and extra-textual features, such as inferences based on previous knowledge, or other kinds of activated representations that could make text information relevant to his/her own purposes. I think, different features are activated and stressed according to goals, learning style, and other personal traits.

According to Van den Broeck, Young, Tzeng and Linderholm (1999), there is a close relation between a reader's standards for coherence and his or her reading strategies. Thus, they argue that

> these standards determine when adequate coherence is attained and when additional retrieval from prior reading cycles or from background knowledge is necessary. If a reader is interested in minimal comprehension, the standards for coherence are met relatively easily, and little reactivation or background knowledge retrieval takes place (p.91).

When Kintsch (1998) reports on experiments involving text coherence he asserts that background knowledge is of crucial importance to help construct a coherent mental representation of the text. In fact, background knowledge is a core concept both in the specific context of reading and in more general learning contexts. As Ferstl and Kintsch (1999) put it, "learning often consists of updating previous knowledge by changing associative relationships between already known concepts" (p. 248). As evidenced by the literature, a computer-supported reading environment is enriched with instruments that help users construct, or identify,

retrieve, and connect, accumulated information, thus facilitating autonomy and control.

2.5 Autonomy and the practised reader

Another central question to be reviewed here and which is of utmost importance when reading strategies are discussed in electronic environments is that related to pedagogical practice. Electronic literacy re-conceptualises the role and expectations of teachers and students alike. How they see themselves and how they see each other. Thus, the point at issue goes further in the classroom with increasing demands on autonomy. The teacher cannot be viewed as the one responsible for the 'architecture' of practised readers. On the contrary, in electronic environments, both teacher and student are supposed to work conjointly and, on many occasions, they are required to present responses very frequently related to still unfamiliar environments. The "permanently partial, polyvocalic (hyper)text" (Winkelman, 1995), for example, is one of them. This conjoint work requires, as Boekaerts (1997) puts it,

> the teacher to create a powerful learning environment, in which students are allowed and inspired to design their own learning experiments. This implies that students should be motivated to actively participate (experiment and reflect) in the teaching-learning processes organised by the teacher and construct their own knowledge base on the basis of direct and indirect learning experiences (pp.166-167).

Consensus has emerged that when reading courses syllabuses are designed teachers have in mind the very clear cut aim of providing their students with strategies which will function as effective tools to help them in their academic/professional reading demands. In fact, teachers are looking for practised readers, "aware of all the text possibilities and who are good decision makers" (Widdowson, 1979). According to Widdowson a practised reader is someone who

> ranges selectively over discourse and draws from it just such meaning as will satisfy his explanations before he begins to read and the predictions which are set up as he reads. He develops a changing cognitive map, as it were, and takes note of what is of relevance to it and let pass what is not, using his knowledge of the communicative system of different universes of discourse as a general prompt but not as a script.(p. 49)

The practised readers are also referred to as self-controlled (Paris, Lipson & Wixson, 1983), competent (F. Smith, 1981), active, independent, subversive (Landow, 1992), self-regulated learners (Zimmerman, Bandura & Martinez-Pons, 1992) able to, as Boekaerts (1997, p.162) claims,

- rely on internal resources (internal regulation) to govern their own learning process;
- set goals for extending knowledge and bolstering motivation;
- be aware of what they know and feel about the domain of study;
- be aware of which general cognitive and motivation strategies are (less) effective to attain the learning goals;
- be aware of how easy or difficult it is to gain mastery in a domain;

- be aware whether they have the capacity and the motivation to invest the necessary resources.

A fuller understanding of the matter related to the building of a practised reader, as characterised above, seems to be contained in the concept of autonomy. Authors like Dick Allwright (1990), David Crabbe (1993), Brian Kenny (1993), William Littlewood (1996), and many others have emphasised the development of autonomy as an important aspect to the learner's empowerment. Allwright defines autonomy in the following way:

> (...) ideally, autonomy is a state of maximal self-development in which the individual has developed his or her own inner resources to the full, and is therefore as self-sufficient as it is personally appropriate to be, but where the individual also:
> a) recognises needs that can only be met by recourse to external resources;
> b) can identify such needs as they arise;
> c) knows how to gain access to the appropriate external resources;
> d) and can do the above both without limiting the autonomy of others, and without unduly compromising his or her own autonomy. (p. 1).

In other words, the practised reader seems to be the 'empowered' one, the concept of empowerment being understood here as taking into account the three perspectives mentioned by Crabe (1993, p.443): the ideological — "the individual has the right to be free to exercise his or her own choices, in learning as in other areas"; the psychological — "we learn better when we are in charge of our own learning"; and the economic — "society does not have the resources to provide the level of personal instruction needed by all members in every area of learning. Therefore, individuals must be able to provide for their own learning needs, either

individually or conjointly". This way, whatever strategies hypertext readers come to use should make them able to enhance responsibility for their learning. The capacity to construct alternative paths, to compare different interpretations and formats, and to retrieve and integrate information are part of the autonomous reader's achievements in this era of electronic literacy.

Within this context, the issue of autonomy also deserves a particular focus of attention in the current study as it involves cognitive and affective domains, which are essential in any learning environment. It is my postulation that the technology of information can offer some support to the enhancement of it.

2.6 Motivation: Towards a definition

As described in the literature, motivation plays a pivotal role on reading comprehension. Volet (1997), for instance, observes that there is growing evidence that differences in individual performance do not occur simply as a result of general abilities, but as an outcome of the conflation of cognitive, affective and motivational features. This is true, I believe, both to paper and pencil and electronic instruction. D. Hancock (1994) draws attention to the little importance motivation has received as a dependent variable in many studies. As several researchers he reviews see it, motivation should be examined as the result of "a function of factors in the educational setting" (p.102). I believe that the technological resources could be one of them.

The issue why some people enjoy reading so much and others simply reject the idea of 'wasting' time reading — or, not to be so radical, read so little — have

called the attention of many researchers of traditional hardcopy reading. Thus, Wigfield (1997) attempts to discuss different motivational constructs. On the other hand, Aebersold and Field (1997), Gutherie and Alao (1997), and McCombs (1997) examine characteristics of classroom contexts, that influence motivation for reading. Oxford (1989) theorised specifically on affective variables (i.e. attitudes, motivational / intensity, language learning goals reflecting motivational orientation, personality traits, and general personality types) that influence language learning in general and their influence on the choice of strategies in traditional printed materials.

On the other hand, the significant amount of literature on the issue in relation to the electronic space is also good evidence of the considerable value it has been receiving from educational practitioners interested in the question of learning in that new environment. The studies of Lepper and Chabay (1985), for example, examine the relationship "between intrinsic motivational appeal of educational activities and their instructional effectiveness within the general domain of computer-based education." They are also mentioned in Kamil et alli's (2000) review of computer-based educational activities and the increase of students' intrinsic motivation. Intrator's (2000) review of literature also point to the positive impact all sorts of computer use have on students, mainly related to "an increase in motivation and other closely related constructs such as interest, enjoyment of schoolwork, task involvement, persistence, time on task, and retention in school" (p.32). Leu (2000) situates the motivation query within the issue of interactivity and comments on the potential of electronic reading and writing to increase intrinsic motivation and de-

centre control. Leu and Reinking (1996) recognise interest and other motivational factors as essential to conventional and electronic reading learning environments.

Wigfield (1997) reports on a study about children's reading motivation in traditional environments. He and collaborators have adapted different constructs put forward by various motivation theorists and phrased them in terms of reading. Thus, the three basic questions are: 'Can I be a good reader?' 'Do I want to be a good reader and why?', and 'What do I need to do to be a good reader?' According to Wigfield, this last question refers to "self-regulation, volition, strategy use, and help seeking constructs that deal with links of motivation and cognition" (p.60). The last question, no doubt, is of special interest for the current investigation.

Heller (1990) comments on the positive relationship reported by several studies between independent learning situations and motivation to learn. In addition, she stresses the importance of further studies in the area.

Williams and Burden (1997) have also researched motivation. According to them, motivation deals with *cognitive* and *emotional arousal*, involves *conscious decision to act*, implies *sustained intellectual and / or physical effort* and is oriented to a *previously set goal (or goals)*.

For the purpose of this work, I shall define motivation simply as *the engagement for doing things*. Such engagement is driven by beliefs and by reasons for performing or not a certain task in an electronic environment, whether or not to read, for example, framed by subjective and objective features.

Other specific motivational considerations guiding the present work are founded on a version of Vrooms's expectancy theory model used by D. Hancock

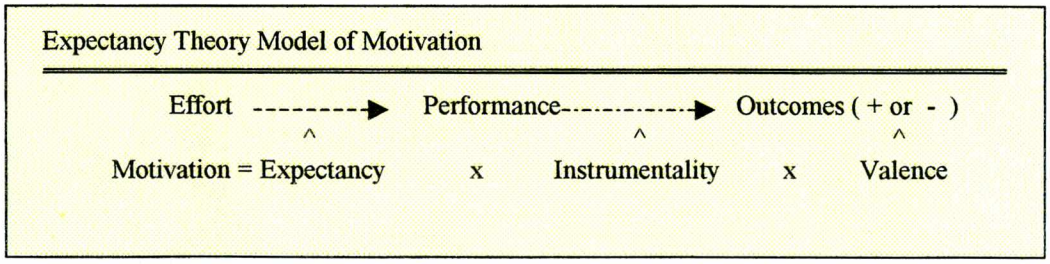
(1994). The following are some of the basic principles of the expectancy theory model:

- People are purposeful beings;
- People's interactions in the environment depend on the relation 'efforts made X value they give to the outcomes'.

D. Hancock (1994) uses a version of Vroom's Theory Model of Motivation (Figure 2) where three perceptual relationships intervene in respect to the amount of effort a person puts into action:

> (a) expectancy — a person's subjective estimation of the likelihood of successfully performing a particular behaviour, (b) instrumentality — a person's subjective estimation of the likelihood that a particular behaviour will be rewarded, and (c) valence — the positive or negative value that a person places on a reward (p.103).

Figure 2. Expectation Theory Model of Motivation (Hancock, 1994, p.103)



It is one of the assumptions of my investigation that hypertext positively affects motivation making learners perform their reading tasks more effectively.

2.7 Hypertext and learning styles

According to Schmeck (1985, as cited in Stanton & Stammers, 1990), learning style is defined as "a predisposition to display a particulart kind of behaviour" (p. 114). Stanton and Stammers' (1990) report on their study about learning styles where they analyse the post hoc justification for subjects' sequences through instructional and practice phases in an electronic environment.. They postulate that there are three broad band strategies: "top-down *('I looked at the most important things first'*); bottom-up (*'I progressed from the very basic information upwards'*); and sequential (*'I went through the modules in an anticlockwise sequence from the overview screen'*)" (p. 115).

Shneiderman (1998b) maintains that "different people have different cognitive styles, and it is quite understandable that individual preferences may vary" (p.207). According to him, there are 'multiple interface styles' that vary according to user and tasks. The topic has also been focused by Leu (2000) when he reviewed individual differences and cognitive learning styles in hypermedia leaning contexts. He postulates that intuitive and theoretical reasons should be considered to justify why newer technologies of information and communication are expected to be prominently sensitive to individual differences. Intutitive reasons refer to the obvious expectation that in a scenario of path diversity users should take different routes according to their personality diversity. Theoretical reasons about field-independence and field-dependence give support to studies related to individual differences. Thus, field-dependent learners "perform less efficiently", while field-independent learners "tend

to be skilled at identifying useful information quickly from a complex context", as claimed by Leu (p.753).

Authors like Williams and Burden (1997), and Ross, Drysdale and Schultz (2001)discuss Dunn and colleagues'(1989)learning styles dimensions that encompass personality traits (affective), inner drive (psychological), the way one perceives, thinks, relates and remembers things (cognitive), and environmental and physical (biological) factors. Oughton and Reed (2000) conducted an investigation following Kolb's Learning Style Inventory where learners are categorised according to their preferred methods for perceiving and processing information as well as the way they relate information to the world. Thus, four categories of learning styles are introduced — Accomodators, Assimilators, Convergers, and Divergers — defined as follows:

- Accomodators valued a lack of structure, a high amount of peer interaction and a lack of authority figures in the classroom;
- Assimilators valued conforming to directions, assigned readings, theory inputs, and lectures;
- Divergers valued self-diagnostic activities, open-ended unstructured homework, lectures , and no-peer information; and
- Convergers valued instructor and expert inputs, reading, and discussions (that linked the classroom to the real world) (p. 367. See also Reed, Oughton Ayersman, Ervin Jr. & Giessler, 2000).

All the researchers mentioned suggest that learning styles are indeed an important aspect to be pondered when information processing is at stake.

Shneiderman's (1998b) theoretical construct on human factors in interactive-systems design includes some vital features involved in the understanding of cognitive and perceptual abilities. He advocates that features like physical, intellectual, and personality differences are essential on the development of interactive systems design in order to accomodate diversity. Among the features he pointed out, I mention here the ones related to cognitive and perceptual abilities and those related to personality differences as they seem to be of utmost importance not only for design but for the purposes of the present study as well. In fact, although with varying levels of intensity and importance, they certainly have influenced the results of the experiment conducted in this study. Some are discussed below and others will be discussed later on, but all of them are drawn upon to help explain the results presented in chapter IV. These are some factors affecting perceptual and motor performance according to Shneiderman (1998b, p.21):

- Fatigue
- Perceptual (mental) load
- Monotony and boredom
- Anxiety and fear
- Personality differences.

In relation to *boredom*, F.Smith (1981) came to the conclusion, while researching learning among young children, that there are two causes of boredom, which can arise from two different sources, namely when there is nothing to learn because they already know, or when they cannot make sense of what they are

expected to learn, as no matching has been achieved in the learner's mind that could intertwine given and new information. That the same types of sources of boredom may be encountered in EFL subjects is suggested by the analysis of the data provided.

As far as the item *personality differences* is concerned, Shneiderman (1998b) observes that designers should benefit from paying attention to personality types in order to avoid mismatches. He acknowledges the great variety of taxonomies in the area and points out Carl Jung's theories of personality types which have inspired some measurable criteria like the Myers-Briggs Type Indicator (MBTI). According to Shneiderman, Jung conceived the existence of four contrasting groups. Table 3 summarises the dichotomies presented in Shneiderman's work.

Table 3. Shneiderman's (1998b, p.22) summary of Jung's theories of personality types

Type	Focus
• *Extroversion versus introversion*	external stimuli, with preferences for variety and action **vs.** familiar patterns, with preferences for inner ideas and working alone.
• *Sensing versus intuition*	established routines, with preferences for the application of known skills **vs.** enjoy new problems; dislike taking time for precision.
• *Perceptive versus judging*	learning new situations; problems in making decisions **vs.** careful planning, that will be carried out even if there is a change in goals.
• *Feeling versus thinking*	other prople's feelings; seek to please others **vs.** unmotivational types; impersonality and logical order.

Different categorisations have also been put forward by some other researchers focusing specifically on the learning style of individuals (Pielstick, 1988. For a review of the literature on the topic see also Busato, Prins, Elshpout & Hamaker, 2000). Indeed, it has been quite common in the hypermedia literature to mention the relationship between such learning styles and information technology. Shaw and Marlow (1999) acknowledge the existence of various studies corroborating this view though they mention some contradictory evidence too.

Honey and Mumford (1986, as cited in Shaw & Marlow, 1999, p 224) have adapted Kolb's Learning Style Inventory and devised a learning style questionnaire (LSQ) that classifies learners according to their strengths and weaknesses demonstrated in each stage of the learning cycle. The result is a classification system as follows:

- Activists: Individuals who are usually enthusisastic when a concept is novel and exciting but tend to lose patience quickly. These individuals learn best from competitive activities and respond well to challenges.

- Reflectors: Cautious individuals who consider their actions carefully before making a final decision. These individuals learn best when given time to prepare in advance.

- Theorists: Individuals who consider all alternatives and make conclusions from their experiences. These individuals usually attempt to fit their observations into a logical model or theory and learn best when required to understand complex problems.

- Pragmatists: Individuals who get impatient with too much reflection and like to experiment with new plans usually putting them into operation immediately without too much discussion. These individuals learn best when the link between the subject matter and the desired outcome is apparent or there are obvious advantages to learning a given task.

In her research on ESL (hardcopy) reading, Carrell (1988) has acknowledged a relationship between the reader's comprehension and a more general cognitive style of processing incoming information, no matter the type of information or the medium of transmission. She has also reviewed Brown's (1987) work in ESL language "learning" or "acquisition" style; Spiro (1978); and Spiro and Tierre (1979) on the same topic but focusing on native English readers. Taken together with other studies quoted in her work, Carrell points to a general construct where individual cognitive styles have a pervasive influence on reading strategies choices. Heller (1990) also mentions the great number of studies allying cognitive style and the ability to function in unstructured, discovery based learning situations. The opportunity of searching alternatives and results provided by hypermedia makes it a concrete component of those discovery based learning situations.

I believe that such categorisations may contribute to the discussion of the results referring to the stages/strategies used by the subjects, as well as their perceptions in relation to the hypertextual format. Again, they are called upon when the results of the current investigation are discussed.

2.8 Cognitive overload

Cognitive overload, also referred to as 'cognitive overhead', has been associated with using complex hypertext systems (Nowaczyk & Snyder, 1993; De Greef & Neerincz, 1995; Rouet & Tricot, 1996; Maddux, Johnson & Willis, 1997). It is fundamentally based on the fact that human information processing capacities are limited, generating changes in people's decision-making process, as Larichev and

Moshkovich (1988, as cited in De Greef & Neerincx, 1995) call attention. Indeed, depending on the level of stress involved, such changes may mean 'just follow the default system', or 'do as you are used to', free interpretations of Anderson's (1990, as cited in De Greef & Neerincz, 1995) 'functional fixedness principle'. The argument runs as follows: "if a tool or solving operator was applied in a specific situation before, then alternative applications to new situations may be overlooked" (p. 545). The issue of overloading caused by an excessive amount of visual information is discussed by F. Smith (1981) and referred to as 'cognitive tunnel vision'. As he postulates, tunnel vision is a result of brain overload and may occur in whatever situations when the brain has to process large amounts of visual information. He adds that the visual processing capacity of the brain can be affected by tunnel vision when anxiety, unpredictable situations, or poor reading habits take place.

Specifically in relation to hypertext platforms, cognitive overload has been defined by Rouet and Tricot (1996) as "an excessive burden on subjects' processes of reading and navigating the hypertext" (p.244). Authors like Brand-Gruwel, Aarnoutse and Van den Bos (1998) comment on how complex reading comprehension is and the several aspects it involves, such as controlling and monitoring reading, checking comprehension of what is being read, integrating information, and so on. If the environment is not very familiar, such as hypertextual platforms, then the task could require extra effort and become tremendously burdensome.

Deficiencies related to human information processing capacities are also implicitly focused when Calvi and De Bra (1998) discuss adaptive on-line systems[2]. First of all, they criticise most studies in the area "for not including the user's learning procedures in identifying which information to present to students" (p.146). The authors' opinion is that such studies lack a model of human cognition that could help explain the learning mechanisms used by student's when a conflict involving usual versus new procedures or situations, and the consequences it brings about is that "subjects build up a hypothesis to discriminate concepts, and that they tend to maintain as many of its features as possible to discriminate concepts whenever a conflict generates" (p.146).

Calvi and De Bra's review also include Weber and Bogelsack's (1995) observation of a similar learning mechanism in the context of problem solving while learning programming. According to Weber and Bogelsack, "students adopt a similarity-based procedure, and perform a similarity-based learning, by applying previous solutions or examples to present tasks or problems" (p. 146). These views certainly resemble Anderson's *functional fixedness* and F. Smith's *tunnel vision* considered before.

In the current study the assumption is that if there was overloading while using the application designed for the experiment conducted, it might have been caused by two levels of difficulties, both related to expertise deficiency: linguistic and structural. De Greef and Neerincx (1995) refer to expertise deficiency as being due to lack of expertise, difficulty in applying expertise, or applying wrong expertise.

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[2] Adaptive on-line system: hypertext system that modifies its link structure during the student's learning process.

To sum up, this study intends to take into account the two perspectives through which reading hypertextually should be viewed: the cognitive perspective, that is related to the strategies the hypertext reader uses or has to acquire in order to face the new demands of electronic environment; and the affective perspective, namely the will-power or inner drive that makes the hypertext reader participate of his/her searching for reading accomplishment (motivation and autonomy) as well as whatever other extrinsic features that may influence the results.

CHAPTER III

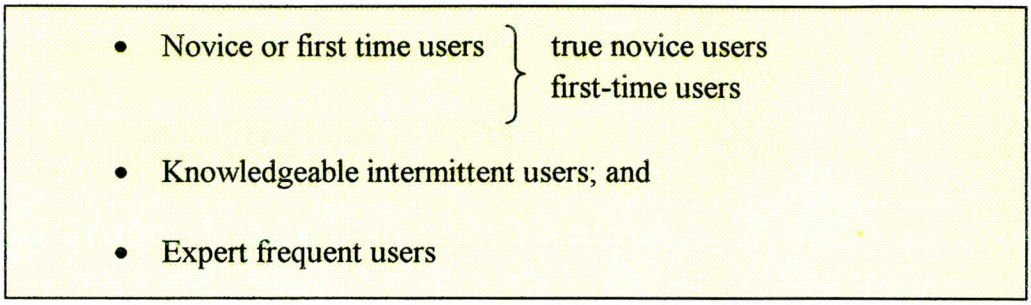
METHOD

3.1 The subjects

A group of 21 EFL students from different major courses at University of Santa Catarina (UFSC), and 2 at a private university, have agreed to be surveyed in this study. A hardcopy test measuring English reading proficiency was taken by the students. Fourteen attained the criterion of 60% of correct answers and were selected for the experiment. However, one student was dropped due to his schedule problems and one for being ill at the time of the experiment. Thus, twelve students participated: five males and seven females. Three from the course of Production Engineering; two from the course of Chemical Engineering; one from the course of International Commerce; one from the course of Psychology; one from the course of Tourism; and four from the course of Letters-English. All of them were Brazilian native speakers of Portuguese, and except for the four Letters students, all of the others were attending extra-curricular reading English courses at the time of the experiment, at Federal University of Santa Catarina. The sessions were conducted individually and took place across a period of 3 weeks in a room specially allocated for that purpose at the university. Photographs of some phases of the experiment have been taken with permission and are shown in the data collection and procedures section.

As for the level of computer expertise, Shneiderman's (1998b) terminology , summarised in Figure 3 was used in order to categorise the participants:

Figure 3. Summary of users' categorisation according to Shneiderman (1998b, pp.68-69)



The first category was divided into *true novice users* (little knowledge of the task domain concepts or of the interface concepts), and *first-time users* (people who know the task domain concepts but have little knowledge of the interface concepts). Both sub-categories are characterised by anxiety about using computers and need an overview to understand what the range of devices provided by the application is, what is not available, what buttons select which actions, etc.

The *knowledgeable intermittent users* are characterised by Shneiderman as having stable task domain concepts, broad knowledge of interface concepts, but some difficulty with retaining the structure of menus or location of features. They need an orderly structure, familiar landmarks, reversibility, and safety during exploration.

Expert frequent users, on the other hand, are very familiar with both task and interface concepts, making efforts to accomplish their tasks quickly. They require fast response times, brief and non distracting feedback and the capacity to carry out actions with the use of just a few strokes or selections. They tend to create accelerators or abbreviators (like *macro,* shortcuts through menus or other

abbreviated forms) to reduce steps and accelerate tasks as well as extensive services to satisfy their varied needs.

In the current study, the subjects have been randomly chosen as regards expertise in the use of hypertext platforms. Nonetheless, some subjects asserted a certain *familiarity* (*'frequency of exposure'*) with the use of computers (word processors or databases) as at least part of the academic activities of their major courses were computer mediated, the access to it occurring at university or at home. A previous informal inquiry regarding the subjects' familiarity with the use of computers was made. The results confirmed the expectation that despite the different levels of acquaintance with computers no one was a first-time user as far as interface concepts were concerned. However, some of them were first-time users of hypertextual platforms for learning purposes. One subject (subject F) acknowledged being used to hypertextual formats as some of the disciplines of his course were structured this way. Subjects D and G could be included in the category of knowledgeable intermittent users, having a relative familiarity with a variety of systems, basic programming and computer use. Subject K considered himself a 'frequent user' of computers as they were his work tools in his job at the City Council. However, he declared that he had never used hypertext for language learning purposes. Finally, subject L declared having a certain familiarity with the format for other reasons (her husband was a hypertext designer). Table 4 summarises the results of the informal inquiry.

Table 4. Subjects' expertise categorisation

	SUBJECTS			
DOMAIN	True novice	First time user	Knowledgeable intermittent	Expert frequent user
Interface concepts	A B I		C D E G H J L	F K
Task Concepts	D J	A B C E F G H I K L		

3.2 The prototype

Before presenting the prototype used in this study, some preliminary comments should be put forward. Firstly, the development of a computer-based learning application, with most of the technological attributes described so far, is not an easy task. It involves a formidable array of human, technical, and material resources, such as a team of subject matter experts, software specialists, and a certain amount of time and money. Secondly, although being an important item of this investigation, the design and testing of an electronic application for its own sake did not constitute the main purpose of this research.

3.2.1 Design

There are innumerable direct and indirect learning resources that could be used to help construct the reader's knowledge base, from the most obvious to the most sophisticated. Information technology provides one of them. Learning

resources should be selected according to the set learning goal, the needs of the learner, and the specific environment where it will be used. As R. Lewis (1993) affirms

> If the goal is to help a novice to learn to ski, a selection will be made from these but of prime importance will be skis and boots, and a slope with snow that is flat at the bottom, preferably prepared so that the task is made easier in the initial stages (p.173).

The design of the current prototype (Figure 4; Appendix H) had the underlying purpose to make the subject matter as simple and useful as possible, considering all the constraints mentioned earlier. It followed a selection that was made in terms of content items (having the reader's needs and expectations into account), level of elaboration, and features of the platform that could create the scenario for the eliciting of strategies. It was also kept in mind that the prototype should be motivating and amusing, and that attended the criteria of usability and learning effectiveness. Norman (1988), Nowaczyk and Snyder (1993), De Greef and Neerincz (1995) remind us of some principles of usability that contribute to the success of a product and has to do with good design, i.e. 'ease of learning and ease of use'. In other words, prototypes should attempt to consider 'visibility' guidelines for the operation of the system so that there is a natural mapping between intended actions and actual operations; also the type of approach, and the type of tasks should be taken into consideration. In addition, the prototype had to be feasible in terms of development (considering the limited availability of human resources in the area of

programming, and the infrastructure of some of our on-campus computing laboratories).

Figure 4. Opening screen of prototype

In terms of usability, the current prototype required minimal system experience, and did not provide many shortcuts. It was field-specific (administration, business, marketing), but not necessarily course specific so readers from different courses could profit from it. Finally, it was devised to provide a context for acquiring task knowledge.

Another down-to earth practical concern has made me opt for a simple hypertextual structure. In fact, simple platforms require lower investment in terms of

equipment and labour resources in order to have computers integrated into the class dynamics and the students started in the trading off with a machine for learning purposes. Moreover, some researchers claim that apart from the enormous amount of elaborated data entry necessary, too many 'bells and whistles' may also imply a lot of extra effort for the reader to retrieve them. Under such circumstances, they may be troublesome, and hinder task performance.

If we consider the schematic learning model (Figure 1) presented in Chapter One, the prototype at this preliminary stage would fit the first and second parts of the box, i.e. those concerned with the hypertext reader interacting with the application aiming at shifting from *personal ignorance* to *private knowledge*, and/or sharing with peers and teacher by means of e-mail.

3.2.2 A browsing system

According to Conklin (1987, as cited in Nowaczynk & Snyder, 1993) there are four broad application areas of hypertext:

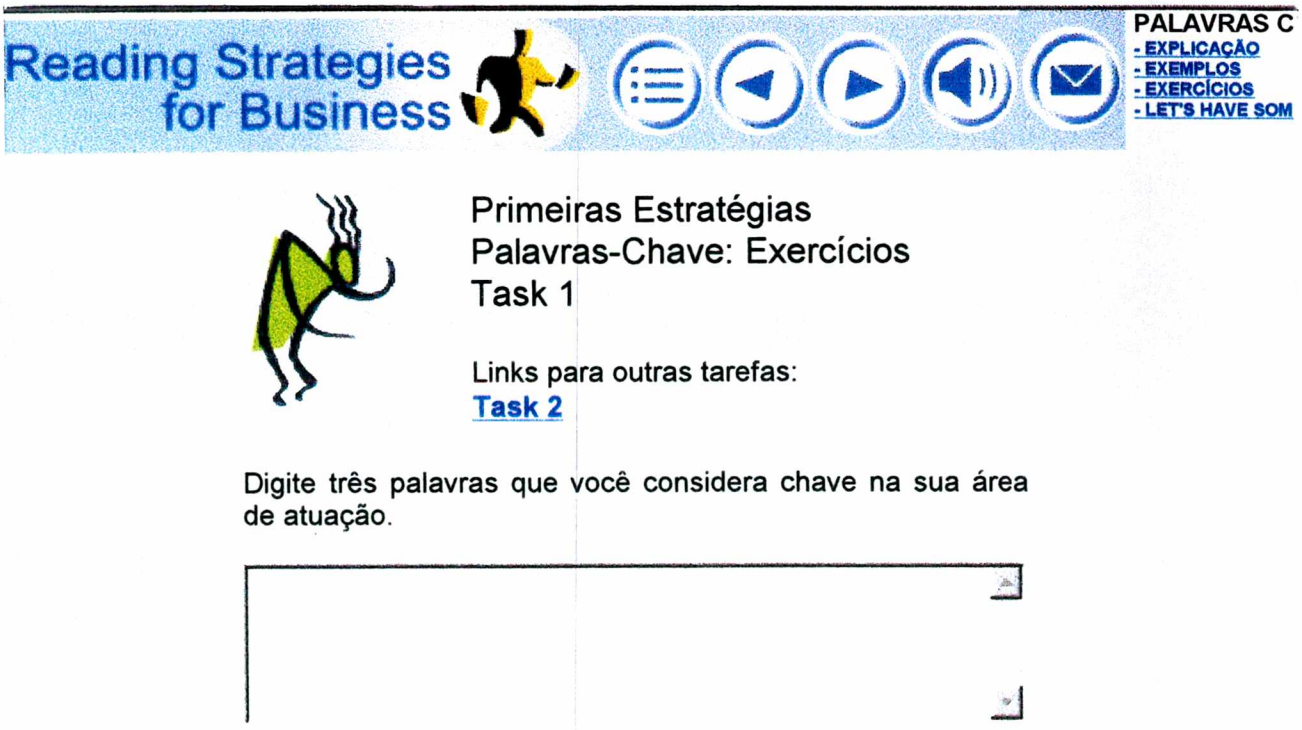
- As macro literary systems;
- As problem exploration tools;
- As general hypertext technologies; and
- As browsing systems.

The hypertextual prototype developed for the experiment to be conducted in this investigation could be considered a browsing system, which presupposes that the learner has to "'browse" through relevant electronic text sections in order to accomplish the tasks assigned. As Heller (1990) puts it, "browsing is often seen as a

technique establishing the size of the territory" (p. 433). She acknowledges exploration as "a natural and spontaneous human desire from a need to deal with the environment" (p.435). On the other hand, Bodner, Chigneli, Charoenkitkarn, Golovchinsky, and Kopack (2001) view it as an opportunistic finding of things of interest, differently from searching "where one is looking for something in particular" (p.508).

Following McKnight (1996), the term "task" means "the carrying out of any goal-oriented activity. In the context of reading, the term includes identifying, locating, and processing relevant material" (p. 224). Evidently a "browsing" system presupposes much more than just browsing to solve the problems posed in the tasks. In the prototype the tasks have been divided into *reading-to-learn tasks* and *reading-to-do tasks*. The prototype contains 'reading-to-learn' and 'reading-to-do'

Figure 5. Example of a reading-to-do task of the prototype



tasks. The former requires the subject to browse and become knowledgeable on the topic being focused, while the latter requires the subject to answer 'open' judgement questions, multiple-choice exercises, and filling-in the blanks exercises related to the topic being focused. For all but two of the reading-to-do tasks feedback is given immediately with the clicking of a button. Examples of the two types of tasks are shown in Figures 5 and 6 .

Figure 6. Example of a reading-to-learn task

Primeiras Estratégias
Conhecimento-Prévio: Exemplos
Exemplo 2

Links para outros exemplos:
Exemplo 1 Exemplo 3

Exemplo da importância do conhecimento de mundo e da necessidade de algumas inferências para o entendimento de um texto. Dê um olhada na história abaixo, contada por um jornalista inglês.

A friend recently checked in late at a Dublin hotel and, being asked whether she wanted anything delivered to her room the next morning, asked for the FT. The clerk desk replied: "Sorry _ we have Earl Greay tea and Chinese tea, but not FT."

O que o leitor precisaria saber para entender completamente o extrato?

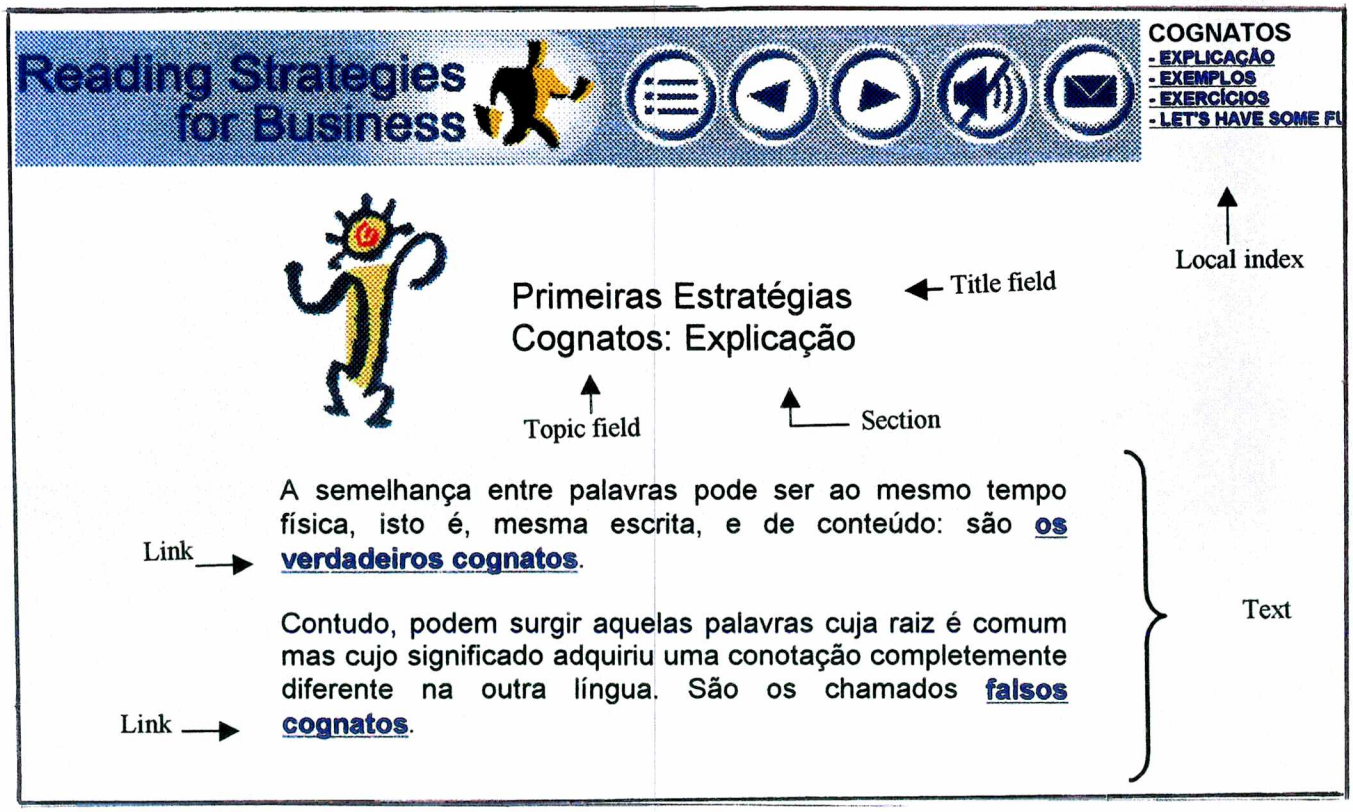
- O que é FT;
- O que é Earl Grey;
- Perceber que a estória se passa em Dublin;
- Ter conhecimento sobre as relações inglesas X irlandesas no tocante ao "Q.I." dos personagens de histórias jocosas.

Clique aqui para ver uma Dica

3.2.3 The prototype's general structure

A stand-alone[3] prototype with minimal interaction features and a minimal set of functions was built. Thus, it has a general read-only structure with minimal possibilities for annotation and no possibilities for changing the author's original textual base. However, it gives the user the interactional possibility of communicating with his/her inner circle by e-mail (✉). It contains 3 nodes, or TOPICS, with four SECTIONS each, and 42 screens overall. Each node contains three fields: (a) local index; (b) titles (title field / topic /section), (c) text. Figure 7 illustrates such a screen.

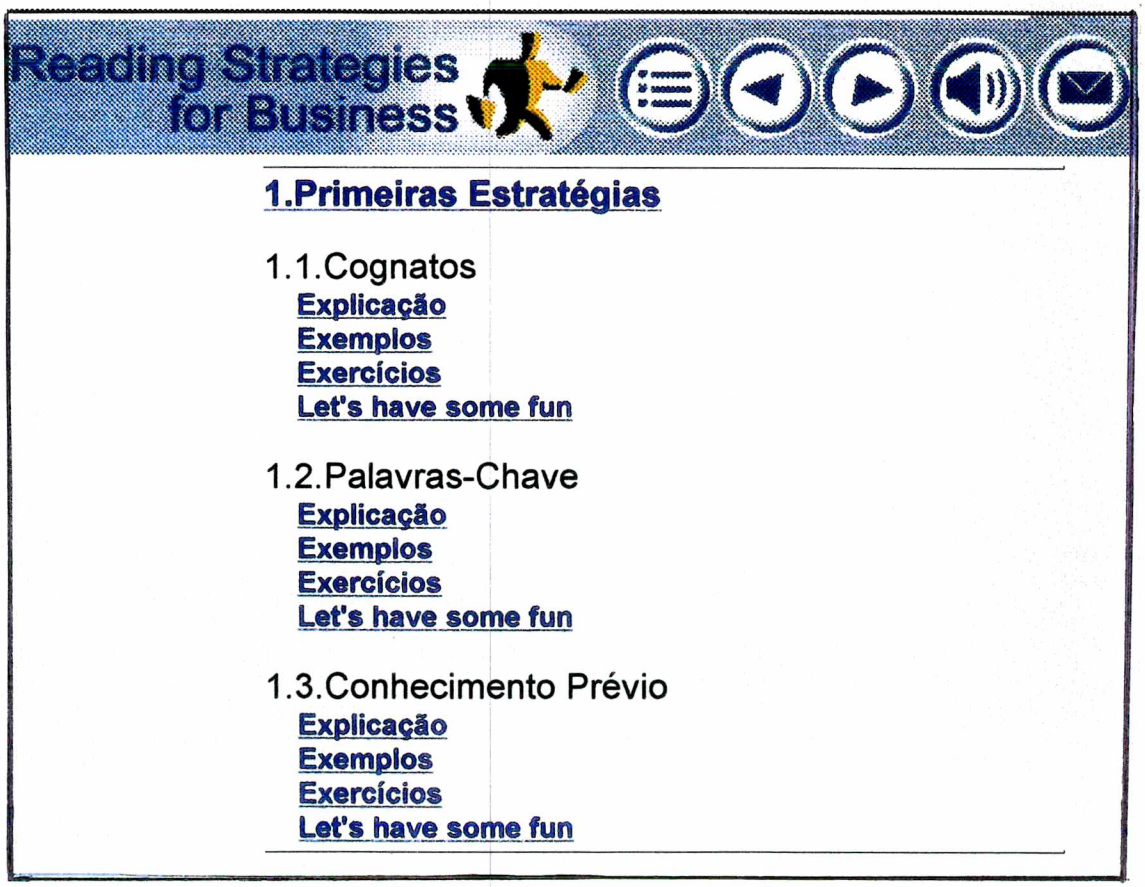
Figure 7. Architecture of a screen of the prototype application used in the experiment



[3] Stand-alone hypertext: not networked such as the WWW, where the subject was limited to choose her reading paths and retrievals and not providing for much jump variety.

The local index or local table of contents shows the user the items available in that screen. It is used to support navigation. The titles situate the user in relation to the local index. The topic shows the user which item is being browsed. It works as an aid adjunct; and the section situates the user in relation to the specific part of the topic that is currently activated. The prototype is provided with a MAIN INDEX, or main table of contents (see Figure 8), that lists the individual topics and sections available in the application. There are also 13 semantic links, whose destinations are

Figure 8. Main index of the prototype



called *nodes*. Links are selected by clicking on author-previously-defined words within the text. In addition, the application is provided with simple audio and visual resources, and basic branching with simple navigational aids that require little system experience to accomplish the tasks successfully.

3.2.4 The task domain and strategies

The task domain, namely the body of knowledge, involved activities related to basic reading strategies. Eight nodes appear in the index but only three (cognates, key words and background knowledge) have been developed and activated for navigation in the present study. The subjects accomplished some reading-to-learn tasks and reading-to-do tasks by clicking; and on other occasions by typing. The system was programmed to accept some plausible incorrect spellings, like 'Brasil', 'Brasilian', initial small letter of proper names, etc. Simple feedback was given by means of exhortation (LET'S TRY AGAIN!) if incorrect answers were typed or clicked, green coloured/red coloured items for correct/incorrect answers, and sound. In the prototype there are no screens with the 'right answer'. The answers have to be deduced by the user, therefore, it was not possible to 'cheat' the sytem like going somewhere, having a look at the answer and coming back to the task screen again. As the exercises are self-paced, the user could try as many times as he/she wished, going back to the reading-to-learn tasks in order to get informed and re-evaluating the situation; he/she could also go back to the task itself and try another answer, or simply move on without re-attempting a different

answer. Another possibility was to move on, concentrating only on the reading-to-learn activities, without doing any of the exercises.

3.2.5 The mode of navigation

The prevalent mode of navigation was the 'index navigation'. By clicking the mouse on the desired item, the subject was taken to the corresponding text node or topic. However, other two ways to traverse the application were provided: page navigation, by clicking on some specific linking words found along the nodes or by clicking on the icon buttons that accompany all screens.

3.2.6 The nodes

Each node or topic provides information about the topic field and has four sections (explanation, examples, tasks, and 'fun') that could be accessed by clicking on forward/backward arrows (◀◀ / ▶▶) allowing the subject to navigate one direction or another sequentially from/to the main index, just like in a hardcopy book. The tasks are provided with direct and/or indirect feedback. By clicking on the 'local index' button that accompanies each screen the subject is allowed to make jumps within the boundaries of each topic. By clicking on the 'local table of contents' random jumps to the main index are also allowed. The main table of contents lists the individual topics and sections available in the application. Apart from that, there are also some link words (13) that the subject can click in order to navigate non-linearly. The audio icon (◀) is also available and the subject can activate or

deactivate it. On certain screens there are tips (extra explanations) related to some tasks that can be activated if the reader has difficulty in comprehending content.

Notwithstanding the lack of structural complexity, I believe that independent learning based on issues such as the user's control as to what to read first, at what speed, when and where to retrieve, skip, or follow chosen linking paths, still maintaining overall coherence, has been preserved.

3.3 Instruments

The main enquiry was explored in a three-stage experiment consisting of the following instruments:

- A hardcopy English reading test that established the level of the subjects' performance in EFL reading strategies.
- A hypertextually formatted ESP unit (the prototype).
- A post-test questionnaire.

3.3.1 Design of the hardcopy reading test

The reading test aimed at screening the subjects' performance on the following higher order strategies: synthesising, inferring, summarising (and evaluating), scanning, rephrasing, note-taking, determining relevance, reference, constructing / searching background knowledge, and applying knowledge from text to outside world (Appendices A and B).

3.3.2 Design of the application content

The scenario created for the verbal elicitation was a content-focused hypertextual prototype developed conjointly by the researcher and two software experts for the purpose of this study.

The single-user application dealt with three basic content reading strategies usually present in almost all conventional English for Specific Purposes (ESP) teaching programmes: identifying cognates, finding key words, and using background knowledge. Such strategies have proved their utility in traditional reading independently of the knowledge domain focused. The texts included in the application were authentic ones, taken from specialised publications (Harvard Business Review) or from newspapers (The Wall Street Journal, The Washington Post). The texts, in a traditional presentation format, had already been used in a conventional ESP course aiming at teaching students to deal with basic strategies that could help them read the documents in English they were required to at work. The assumption here is that such importance is also maintained in electronic environments.

The material used in the prototype had formative goals, namely it aimed at creating a learning context where the augmentation of specific reading strategies could be achieved. The subjects were provided with verbal and written instructions (see Appendix D) on how they had to indicate the strategies they thought they were using.

The unit privileged activities involving multiple choices, matching, filling the blanks, and open-ended questions. The domain area of both the English pre-test and

the hypertexual prototype was Social Studies, an area that seems to offer the possibility of accommodating diverse world views and backgrounds.

3.3.3 Design of the hypertextual platform

Due to the non-availability of electronic teaching materials in conformity with ESP principles in the market, the researcher developed her own hypertextually-formatted prototype to be used in the experiment. It goes without saying that following the very nature of prototypes, the present one is dynamically moving as far as implementations are concerned. Its first version has been piloted in a one-subject experiment in order to check the need of further refinements of design, use, and content.

3.3.4 Design of the post-test questionnaire

This study used a post-test questionnaire (Appendix E) to identify the subjects' perceptions about the features of the hypertextual format, individual attitudes in relation to its use in their major courses, level of satisfaction with the format, and other positive and negatives points of the format. In other words, how the format affected motivation and learning from the subjects' standpoint.

The questionnaire consisted of 13 questions: eleven multiple-choice questions and two open-ended questions. The aspects considered in the questionnaire were: ease of use of the hypertext, level of satisfaction with the format, perceived length of

time taken to solve the tasks, perceived usefulness to the reader and course, level of frustration, and other positive and negative feelings towards the instruction.

3.4 Data collection and procedures

Phase 1

Hardcopy test

(One group session lasting approximately forty minutes)

Application of a hardcopy strategic English reading comprehension test. The reading comprehension test consisted of a 337-word text with related tasks involving higher order strategies such as application, analysis, and evaluation of information, at the word, sentence, and text levels. Only those achieving 60% (or above) of correct answers took part of the second phase of the experiment. Twenty two tests were applied and fourteen students achieved the level required. Two students quit the experiment before the second phase started, one due to schedule problems and another due to health problems. Thus, twelve students took part in the experiment.

Phase 2

Familiarisation with hypertextual application

(Individual sessions lasting 10 minutes)

An initial 10-minute modelling session for familiarisation purposes was undertaken. The subjects had the opportunity to see a hypertext and its concurrent think-aloud

verbal protocol being modelled by the researcher. The length of this phase was very flexible as some subjects acknowledged a certain expertise on either the platform and/or the use of computers. No inquiy was made in relation to the subjects' previous experience with think-aloud procedures and none of the subjects have made any comment about having already experienced such procedure either.

Phase 3

Use of hypertextual prototype

(Individual session lasting one hour)

This session consisted of the application of a hypertextually-formatted ESP unit accompanied by a concurrent think-aloud protocol (Figure 9).

Figure 9. Subject undertaking the hypertextual experiment (photo taken with permission)

Phase 4

Post-test questionnaire

(Individual sessions lasting 10 minutes)

When participants completed the tasks assigned in the hypertext, they answered a hardcopy questionnaire (Figure 10; see also Appendix E) on the site consisting of questions about affective aspects related to the use of the hypertextually-formatted). This completed the experiment.

Figure 10. Subject undertaking the post-experiment test (photo taken with permission)

3.4.1 Data collection and procedures: The think-aloud protocol

The think-aloud protocol was chosen because, notwithstanding the questionings about conscious processes in reading, as Pressley and Afflerbach (1995), Tomitch (1995), Coté and Goldman (1999) acknowledge, it still constitutes a credible method to investigate the content of subjects' short-term memory while reading. Among the possible disclosures resulting from the content of think aloud protocols and pointed out by Trabasso and Magliano (1996) when reviewing the topic, one deserves to be foregrounded, i.e. that "think-aloud protocols should also show how available information is used in an *effortful* search for meaning during comprehension. (...) As such, think-aloud protocols expose conscious, strategic processing" (p.256). However, they ascertain that some nuances of think aloud situations may contribute to underestimate or overestimate what is thought about during understanding. The former situation may occur when the subject does not report, for whatever reasons, all the thoughts; and the latter, when the subject communicate more ideas than in a normal, silent reading. Yet, they assert that the thinking-aloud protocol is a valid method for assessing what readers have just read.

Afflerbach and Johnston (1984, as cited in Pressley & Afflerbach, 1995) posit that protocol analysis can

- provide data on cognitive processes and reader responses that otherwise could be investigated only indirectly;
- sometimes provide underlying sophisticated cognition, response, and decision making; and

- allow for the analysis of affective processes in addition to (or in relation to) cognitive processes (p.4).

Further support for the use of think aloud protocol as a technique to obtain accurate data comes from McKnight (1996) (electronic reading environments); Davies (1995), Cohen (1998) (both referring to traditional printed reading environments). Although acknowledging criticisms related to interference "with the normal processing involved in task performance, (i.e. "cognitive intrusion" and to the necessity of having an experimenter *in loco* "to sustain and record the verbal protocols" (p.226), McKnight (1996) advocates that they have three advantages: it is cheap, naturalistic ("requires no elaborate equipment" and "the data is elicited wherever a subject normally reads"), and physically non-intrusive.

Drapper and Anderson (1991) put forward some difficulties found in the use of "naturalistic" verbal data — think-aloud here included. First, there is the problem of interpretation ("how can we be sure that what a person says corresponds in any direct or simple way with what was actually meant?" (p. 95); secondly, difficulties related to the process of coding the data, that could lead to categorisation ambiguity; third, and a consequence of the previous item, cloudy criteria might be used to determine what will be privileged in such a multifunctional environment.

Pressley and Afflerbach (1995) sustain that the analysis of data obtained with the think-aloud methodology also helps drawing conclusions on the affective process of reading. That was confirmed in the think-aloud data obtained in this investigation, which permitted, among others, draw affective insights about the subjects' on-line interactions with the electronic text. A more detailed view of this point is presented in Chapter IV.

Special attention was given to instructions delivery. The intention was to avoid instructions that could elicit specific cognitive behaviours, as remarked by Pressley and Afflerbach (1995). Thus, subjects were told in Portuguese that *an experiment on electronic reading was being conducted* and that they were supposed to *provide a concurrent think-aloud protocol with all the actions carried out in order to solve the tasks in the hypertext as well as the problems they experience along the unit, and the perceived benefits.* The *think-aloud procedure* was interpreted in layman terms to the subjects as 'please, verbalise each action you intend to take, each decision you intend to make, or any feeling you have in relation to the situation, the content, the system, or in relation to yourself'.

3.4.2 Data analysis

The subjects' verbal protocols were transcribed and analysed following Kaur, Maiden and Sutcliffe's (1999) elaborations on Norman's (1988) seven-stages model of interaction (Figure11). The major verbalisation categories are described in Section 4.4.2 when the subjects' sources of coherence are discussed.

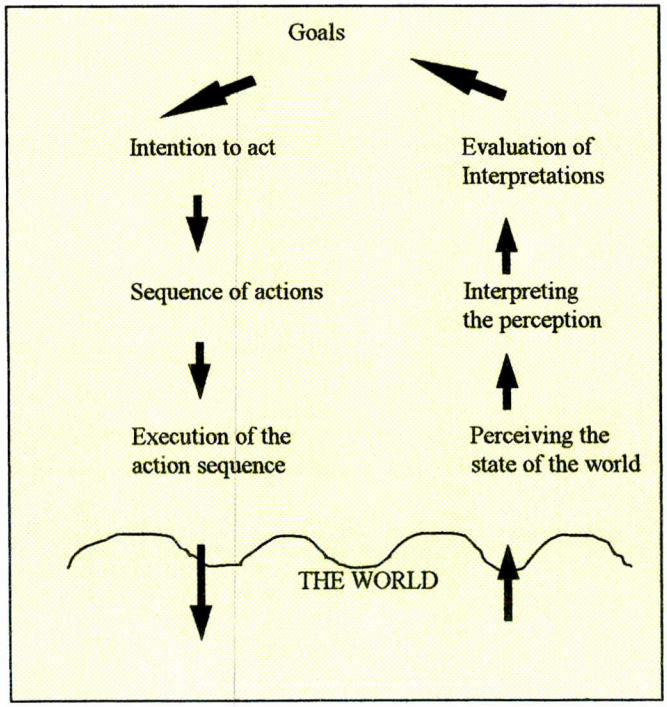
In general, Kauer et al. retained Norman's assumptions on the action and evaluation cycle and added twenty-four new stages as a result of an experimentation in a virtual environment (VE).

A characteristic of theories and models is that they provide a framework that favour the discussion of issues that are application independent. As claimed by Shneiderman (1998b), Norman's could be classified as an explanatory theory, i.e.

one "that is helpful in observing behaviour, describing activity, conceiving of designs, comparing high-level concepts of two designs, and training" (p. 53).

One of the assumptions of the present investigation was that, although the model has been designed to be used in computer simulated environments, the concept of a single-user interactional modelling it is based on — "the spatial structure of the model remains fairly static and the user navigates around the model, to locate objects of interest" (Kauer, Mainden & Sutcliffe, 1999, p.403) — could provide for the metaphorical process features needed to explain electronic reading contexts.

Figure 11. Norman's (1988, p.47) seven stage model of interaction



In spite of the degree of technological complexity that sets VE and hypertext apart, both share some fundamental features which are integral to computer-based

environments such as user-machine interaction, target object exploration and manipulation.

Simulations, as defined by Maddux, Johnson and Willis (1997), "are models or descriptions of events and conditions (...) where players take a role and determine what happens next by the decisions they make" (p.216). Card (1989, as cited in Scheiderman, 1998b) argues that "[a]ny theory that could help designers to predict performance for even a limited range of users, tasks or designs would be a contribution" (p. 54). In addition, Shneiderman (1998b) sustains that Norman's model outperforms other models in that it implies a dynamic process involving cycles of action and evaluation. It also contributes to the implementation of interface good design since it provides for the identification of the *gulf of execution* — "the mismatch between the user's intentions and the allowable action; and the *gulf of evaluation* — "the mismatch between the system's representation and the user's expectations" (pp. 57-58). Pilkington and Parker-Jones (1996) validate the view that simulations play a unique role in supporting learning by providing a fertile environment for direct and dynamic manipulation of objects, for the observation of the effect of such manipulations through visualisation thus helping in abstract reasoning.

The hypertextual format used in the application of the current investigation plays such a role in the sense that users can 'handle' the unit the way they like, visualise results, change directions, practicing making decisions, thus concretely participating of the learning process.

Thus, I believe that the model might be an effective tool to pinpoint and classify the stages/strategies used by the subjects in this experiment.

All the occurrences concurrently reported by subjects along the experiment undertaken in this study were classified under the elaborations made by Kauer, Maiden and Sutcliffe (1999) of Norman's model. Kauer and collaborators present three inter-connected models (Figure 12), that describe modes of VE interaction:

Figure 12. Kauer, Maiden & Sutcliffe's (1999, p. 405) models

Task Action Model (TAM) — describes a purposeful behaviour in planning and carrying out specific actions as part of user's task of current goal/intention, and then evaluating the success of action.

Explore Navigate Model (ENM) — describes opportunistic and less goal-directed behaviour when the user explores and navigates through the environment.

System Initiative Model (SIM) — describes reactive behaviour to system prompts and events and to the system taking interaction control from the user (for example, taking the user on a pre-set tour of the environment).

The 24 additional stages (Figure 13) to Norman's model, are the result of the analysis of a random selection of tasks for each participant. According to Kauer and collaborators time constraints prevented the analysis of participants' full interaction sessions. The product of the refinements on Norman's model made in Kauer and colleagues' test application is shown in Figure 13. Other elements perceived by the students as being relevant or important when dealing with the hyperdocument, and my own inferences drawn from the analysis of the data collected provided useful qualitative insights for answering the issues related to affective aspects and electronic environments.

Figure 13. Kauer, Maiden & Sutcliffe's (1999, p. 425) twenty-four additional stages to Norman's model

1. interpret navigation feedback
2. intention to execute command
3. scan and inspect an area
4. intention to approach target
5. consider location
6. intention to open door for navigation
7. evaluate exploration carried out
8. deduce the sequence required for navigation
9. interpret the feedback after an approach
10. deduce the interaction sequence after carrying out an action
11. scan and check the view angle or orientation of self
12. consider attributes of target object
13. evaluate completed tasks
14. plan for future tasks
15. consider content of environment
16. predict what a planned navigation will bring into view
17. plan on how to take control back from the system
18. decide to give up on a task
19. intention to opportunistically carry out an action for a different task
20. evaluate the state prior to the action execution
21. perceive the end of an event with a long duration
22. evaluate navigation method
23. predict what will be the outcome of an exploratory action
24. predict the current position in the world

3.5 The pilot study

A pilot study was conducted on December 2000, four months before the main study. It aimed at identifying beneficial and harmful aspects of the application, thus providing grounds, in the latter case, for refinements and implementation.

3.5.1 The subject

The volunteered subject was a 20-year-old female student majoring in Administration (5th semester) at Federal University of Santa Catarina, with some

computer literacy background ('intermittent knowledgeable'), such as word processing, e-mailing, and Internet searching. She could also read and write in English.

3.5.2 Content of the pilot hypertextual application

The hypertextually-formatted ESP unit focused on the following basic reading strategies: cognates, key words, and background knowledge. Such strategies are usually present in most hardcopy ESP teaching programmes. The choice involving the items developed for the hypertextual application was at random. However, those three strategies are usually pointed out in the hardcopy reading literature (Grellet, 1981; Nuttall, 1982; Hutchinson & Waters, 1987; Brazilian ESP Project) as very useful independently of the knowledge domain focused.

3.5.3 Testing the pilot hypertextual application

The conducting of the pilot study allowed for careful analysis of issues affecting the development of the study in general and of the experiment in particular. It helped checking weaknesses and strengths of the prototype and the testing proved very useful to promote necessary adjustments as far as design requirements, clarity and content accuracy were concerned. The prototype was refined over two months after the pilot study was conducted. The main aspects reviewed aimed at reducing overloading (related to navigation), and irrelevance hazards (related to content, and application functionality).

3.5.4 The main changes

The observation of the difficulties the user had in relation to task performance, time constraints, and other problems (here defined as 'user analysis') proved to be a vital source of relevant information, demonstrating that some changes had to be done. Thus, some data transformations related to navigational aiding and cognitive support were undertaken. The main modifications were related to the following aspects:

- The inclusion of content and navigation mappings ('hints' and 'local index') so that the subjects could count on extra help from the application to accomplish the tasks more easily. The upper bar, with navigation icons was modified to accommodate the local index.
- In the pilot study there was the use of a demo application as a familiarisation device. Thus, the subject went through a modelling/familiarisation session using a demo hyeprtextual module developed by Gariglio and Coura (2000) on discourse markers. This proved to be tiring for the subject as it made the session extend longer than the planned 60-minute. The demo application was totally system controlled as it was provided with an automatic guided tour structure which did not allow a user controlled exploratory navigation. In other words, the subject had to accomplish each task in order to be allowed to move to the next. This took some precious minutes from the following phase, namely, the experiment itself. In addition, as the subject had a tight agenda for that day, she tried to hurry in the last quarter of hour of the experiment. Therefore, to avoid long, burdensome sessions the demo application was not used in the main study.

Instead, the subjects were familiarised with the hypertextual structure and the verbal protocol procedures by using the Centro de Comunicação e Expressão (CCE) page on the Internet.

- The inclusion of the e-mail function, as the application lacked dialogical devices that could provide for interactions with the subjects' inner circle (i.e. the other participants of the experiment).
- The pilot application had an excessive number of tasks. Therefore, three tasks were removed and others were re-stated. In addition, some tasks had their requirements shortened. As a result, the application gained in interactivity and dynamism.

CHAPTER IV

RESULTS AND DISCUSSION OF THE MAIN INQUIRY

4.1 The experiment

The primary goal of the research reported here was to map the strategies Brazilian EFL readers used for getting through a learning-purpose hypertextual application. In order to answer this question, the tapes with the twelve subjects' verbal protocols were collected and transcribed for content analysis. They were classified as regards strategies used having the 24-additional stages identified by Kauer and collaborators and built upon Norman's seven stages model as a guideline.

There were no significant differences in the conditions of application performance. Thus, it may be said that the twelve participants had similar environmental conditions, and were exposed to equal read-to-learn and read-to-do tasks. Therefore, possible differences in stages/strategies used are to be attributed to differences in expertise and/or level of engagement.

4.2 The strategies spotted

Seventy-one stages/strategies have been identified (Table 5) across 1 567 moves corresponding roughly to randomised stages of orientation (*inspecting an area,* for example), planning (*intention to take an action*, for instance), execution (*executing actions*). In between these stages/strategies, others have come out, like

reading documentation, problem reporting, interpreting, evaluating, etc., all of them influenced by beliefs, perceptions, (mis)conceptions, learning styles in relation to the subjects' study method and also to their cultural context.

As it was expected, the coding of the seventy-one stages/strategies was not always a straightforward task. As also mentioned in Draper and Anderson (1991), there happened problems of interpretation, ambiguity, change, and multi-functionality of some of the utterances. For instance, on some occasions an utterance seemed to fit several different situations or codings, sometimes it seemed rather vague, pulverised or scattered across the protocol, and sometimes it seemed not to fit anywhere. To cope with such situations, a certain dosage of intuition and good sense was used.

Vagueness of criteria was avoided as much as possible with the use of Kauer et al.'s definitions of the modes and with my own perception of what each of their twenty-four additional stages meant. This criterion was also used to create a mental representation for each of the forty-two extra stages/strategies identified in this work. However, there were moments when to discriminate, for instance, between 'attributes of target object' and 'attributes of content' or 'attributes of the environment' was a real problem. Likewise, to infer whether the subject was laughing of enjoyment or nervousness required a more global analysis of the situation. The annotations made along each session helped me disentangle possible doubts.

It is important to note that the terminology adopted in the current study — *stages / strategies* — refers both to the stages or moves gone through the subjects

along the experiment and the s*trategies* used by the subjects to deal with the reading-to-learn tasks and reading-to-do tasks of the application.

Table 5 lists all the stages/strategies spotted in this study. The red colour indicates that the stage belongs to the Task Action Model (TAM), the blue colour indicates the stages are related to the Explorate Navigate Action Model (ENM) and the green colour indicates that the stage belongs to the System Initiative Model (SIM).

Table 5. Stages/strategies identified

SEVENTY-ONE STAGES IDENTIFIED	ACRONYMS
01 Check attributes of environment	CAE
Agora, só tem dois nesse?	
02 Consider attributes of the system	CAS
Ah, dá prá clicar aqui do lado...!	
03 Check attributes of target object	CATO
Esse é um termo em inglês, né?	
04 Consider content of environment	CCE
Ah, isso aqui já é outra coisa	
05 Consider content of target object	CCTO
Ah, tá, isso aqui eu já olhei no inicio	
06 Check the end of an event with a long duration	CEEWLD
Pronto?	
07 Check & inspect an area	CIA
Ah, será que é isso que eu quero?	
08 Consider location of target object	CLTO
Achei um cognato aqui, 'industry'	
09 Consider attributes of target object	CNATO
...então as que estão marcadas em negrito [é] que são as palavras chave	
10 Check navigation method	CNM

Aqui eu posso escolher o que eu quero, esses links aqui?

11 Check orientation of self — COS

E agora, faço o que quiser?

12 Check the sequence required for navigation — CSRN

E agora...prá voltar...aqui, né?

13 Check task requirement — CTR

Associar essas palavras com três textos?

14 Check the view angle — CVA

Aquele é o exemplo? Isso é o exemplo?

15 Check what will be the outcome of an exploratory action — CWWBOEA

...tá, eu teria que achar título pros três, né?

16 Decide to give up on an action — DGA

Vou ver outra coisa...

17 Decide to give up on a task — DGT

Desisti de fazer o exercício

18 Deduce the interaction sequence after carrying out an action — DISACA

Ih, não sei o que é cognato. Tem que voltar lá...então vamos voltar

19 Deduce navigation method — DNM

Ah, tá, eu digo quando eu cliquei...

20 Deduce the sequence required for navigation — DSRN

...agora, se eu quiser voltar prá tela, eu volto, se eu quiser passar prá outro item, eu passo prá frente

21 Evaluate attributes of environment — EAE

...mas tá legal[a página]tá limpa, né...

22 Evaluate attributes of target object — EATO

...é, mas devia usar Termos em português

23 Execute command — EC

...voltei no exemplo

24 Evaluate content of environment — ECE

...mas é muito legal isso aqui...muito bom

25 Evaluate completed task — ECT

É super legal. Gostei desse aqui

26 Evaluate content of target object — ECTO

Que bom ver isso em teoria porque a gente sabe mas a gente não usa nunca (ri)

27 Evaluate exploration carried out — EECO

...nem lembro mais o que é que eu vi...

28 Evaluate himself/herself — EH

É, acertei...tô bem!

29 Evaluate [her] current position

...nunca parei prá me preocupar com isso.. — EHCP

30 Evaluate navigation method (his/hers or the application's) — EVNM

Sou muito sequencial... deu prá notar, né?

31 Evaluate system — ES

Sabe o que devia fazer? Devia ficar vermelhinho o que a gente já entrou. Prá lembrar

32 Evaluate the state prior to the action execution — ESPAE

Era esse que eu queriaa, mas não tinha nada...

33 Interpret attributes of the environment — IAE

...ela fica... tem horas que você tem que usar muito, né, então prá você fazer, responder uma questão, você precisa ficar subindo e descendo nela...

34 Intention to approach target — IAT

Vou entrar em explicação

35 Interpret attributes of target object — IATO

...aqui eu pensei que era 'demanda', mas eu fiquei meio...

36 Intention control action — ICA

Bom, por enquanto é isso.
Deu.

37 Interpret content after an approach — ICAA

...ainda mais na Inglaterra, né, um cara pedindo um chá...

38 Interpret content of environment — ICE

Ah, tá, 'colaborar' seria tipo uma pessoa...

39 Interpret content of target object — ICTO

Isso aqui fala da falta de educação dos nova-iorquinos, né?

40 Intention to execute command — IEC

Tá, vou voltar prá página inicial

41 Interpret exploration carried out — IECO

...é que ações...eu já confundi 'ações' com falsos cognatos, então pensei que se eu tivesse alguma coisa aqui de Tóquio eu ia ficar realmente em dúvida se era aqui ou se era aqui. Por isso que eu...

42 Interpret feedback after an approach — IFAA

A democracia é a única coisa que tem mais a ver...ah, tá...hum, hum...

43 Interpret navigation feedback — INF

...é que eu fiz duas vezes. Escreveu duas vezes, você viu?

44 Interpret navigation method — INM

...ai eu digo: cliquei aqui, ou...

45 Intention to opportunistically carry out an action for a different task — IOCADT

Ah, então eu vou ver os exemplos...

46 Intention to re-approach target object — IRATO

...tenho que ler tudo de novo...

47 Justify problem report — JPR

... é nervosa não é por causa do teste, é por causa do tamanho da letra...

48 Locate the current position in the world (his/her position or the target object) — LCPW

É mais ou menos dentro do que eu aprendi

49 Locate problem — LP

Mas o problema tá aqui, ó, na rolagem...

50 Perceive the end of an event with a long duration — PEAWLD

...acho que já vi tudo

51 Plan for future action — PFA

Depois eu vejo se estão certinhas

52 Plan for future tasks — PFT

...então eu vou falar, só. Não tô a fim de escrever, não

53 Plan how to navigate — PHN

Acho que vou em tudo, né, prá ver o que é que tem que fazer...

54 Plan how to take control back from the system — PHTCBS

Apagou tudo. Então vamo lá. Vamo ver se dá certo: control B...

55 Problem report — PR

Eu não entendi o exemplo, então

56 Predict what a planned navigation will bring into view — PWPNWBIV

Não, mas eu não errei...eu não quero trocar...

57 Predict what will be (his/her)position in the world PWWBHPW

Ah, tá, pelo meu log in eu poderia participar

58 Predict what will be the outcome of an exploratory action PWWBOEA

Não vai dar certo. Quando a gente não...

59 Reconsider attributes of target object RCATO

...porque 'participação da mulher' não parece ser por causa da palavra aqui que lembra 'civis'

60 Reconsider intention to re-approach target RCIRAT

Não, eu vou entrar no de conhecimento prévio..

61 Reconsider the content of target object RCTO

...eu tinha colocado uma outra Terceira palavra...

62 Read documentation RD

"...palavras chave que evidenciam a escolha feita acima."

63 Reconsider hypothesis RH

...deixôvê...

64 Scan & check attributes of target object S&CATO

O texto é outro?

65 Scan & check the view angle S&CVA

E agora?

66 Scan & check the view angle or orientation of self S&CVAOS

O que é isso?... Ah, essa é a ...

67 Scan & inspect an area S&IA

Tô lendo os textos

68 Scan & check an area SCA

'Exemplo' eu já fiz?

69 Set a goal SG

...prá ver se eu entendo o contexto dele, eu acho...

70 Set hypothesis SH

Pelo título eu botaria POLÍTICA

71 Test hypothesis TH

...qué vê...eu vou botar ele aqui no meio...

The stages/strategies have been grouped according to the nature of the actions performed, i.e., task action (planning and carrying out specific actions), explore navigation (exploration and navigation through the environment), and system initiative (reactive behaviour to system prompts and events), corresponding to the three models mentioned in section 3.4.2. Detailed results, including individual number of occurrences for each mode is presented in Appendix F.

4.2.1 Predominant stages

Six predominant stages/strategies have been identified, following Kauer and collaborators (1999). The term *predominant* was applied to those stages/strategies that accounted for at least 5% of the total of moves (1 567). The six predominat stages/strategies represented 70,77% (1 109) of moves. Table 6 summarises this finding.

Table 6. Predominant stages/strategies

MODEL	Predominant Stage	acronym	% of all stages/ strategies
TAM/ENM / SIM	intention	INT	19,14
ENM	scan & inspect	SCN	15,06
TAM	read documentation	RD	11,49
TAM & ENM	evaluate	EVL	11,23
TAM & ENM	check	CCK	8,49
TAM	consider	CND	5,36
TOTAL	1 109 moves		**70,77**

For the purpose of the present study the six predominant stages (intention / scan & inspect / evaluate / check / consider/ reading documentation; plus execute, and problem report) have been defined in the following way:

1. *Intention*: specific action taken to get to a goal.

2. *Scan & inspect*: refers to any exploratory behaviour, including navigational moves.

3. E*valuate*: personal responses about the task or about the users' mental state. It includes judgements of liking, feeling happy, uncomfortable, etc. in relation to various aspects of the application;

4. C*heck*: interrogative syntax about attributes, content, location, navigation, or orientation. The hidden questions related to the search for feedback have also been included under this label (*check view angle strategy*).

5. *Consider*: the term refers to any reasoning about the attributes, content, location of target object or environment.

6. *Read documentation*: verbalisation arising from subject repeating verbatim task statements, a sentence, or parts of a text. Kauer and collaborators have not included this strategy in their 24-additional stages probably because their experiment was of a more visually oriented nature and purpose, while the present study is more textually oriented.

Two other stages accounted for 9,44% of the total: *Problem report* (4,91%) and *Execute* actions (4,53%). They have been defined in the following way:

7. *Execute*: physical accomplishment of the actions.

8. *Problem report*: According to Flake, McClintock, and Turner (1990, as cited in Maddux, Johnson & Willis, 1997), problem is one of the following:

> a. A question for which the answer is not easily obtained and for which the problem solver must search for, deliberate on, and create a valid answer.
>
> b. A difficulty that must be overcome for which resources must be marshalled or created and for which the resolutions must be invented (a strong desire is present for overcoming the difficulty).
>
> c. A goal that is obstructed but for which motivation is present. To achieve the goal, the problem solver must creatively develop a way of overcoming the obstacle (p. 297).

In the current study, the term *problem* appears as an umbrella term encompassing comments describing difficulties faced, "such as being unable to understand the current situation, or making slips (e.g. "oops")" (Kauer et al.,1999, p.413), and also ruminations like worries, regrets, anxieties.

These stages/strategies were also considered as they were the closest to 5% of all moves identified moves. Altogether, the six predominant stages/strategies plus the two other stages/strategies accounted for 80.21% of all moves (Table 7). The remaining 19.7% of moves were distributed among the other 63 stages/strategies.

Table 7. Stages closest to 5% of the total of moves

MODEL	stage/strategy	acronym	%
TAM	problem report	PR	4.91
TAM	execute	EC	4.53
TOTAL			9.44
OVERALL (six + two stages/strategies)			**80.21**

4.2.2 The models

There was an outstanding use of TAM (66.2%), followed by ENM (31.98%). The stages/strategies identified have been grouped and percentages calculated, as shown in Table 8 .

Table 8. Percentage of all stages/strategies identified in the think-aloud protocol, with acronyms

MODEL	Number of stages	%
Task action model (TAM)	47	66,2
Explore navigate model (ENM)	22	31,9
System initiative model (SIM)	2	2,8
TOTAL (of stages/strategies)	71	
TOTAL (of moves)	1567	

The Initiative mode, i.e. actions related to the System Initiative Model, had a low rate of occurrences. Three non-excluding causes may explain such a low frequency: a) the application did not provide for personally significant approaches, i.e. "the user is not always able to play the master role", as De Greef and Neerincz (1995, p.533) argue in relation to user-centered systems; b) the mode is application dependent, as Kauer and colleagues (1999) claim to justify similar results. As they hypothesise, system initiative may be unimportant for applications involving very little system behaviour; and c) the subjects may have opted for a 'conservative', non-challenging default navigation style. This last possibility might find support in the concept of *tunnel vision* discussed in section 2.7. The 'simplification for the sake of

consistency' principle may also be drawn upon to help justify the low occurrences of initiative modes (SIM).

4.2.3 Some comparisons

➢ **The subjects' choice of strategies profiles**

To compare the subjects' choice of strategies profiles a Simple Correspondence Factor Analysis of all the subjects' moves (Appendix F) was undertaken. This figure is a Frequency Table in which the horizontal row (horizontal dimension) shows the 71 strategies spotted in the experiment, and the columns represent the 12 subjects (vertical dimension). The numbers that appear in the cells represent the number of times that a strategy has been used by the subject of each column. Thus, for instance, subject B used strategy 21 (*scan and inspect an area)* 16 times, that belongs to the Explore Navigate Model.

This analysis permitted:

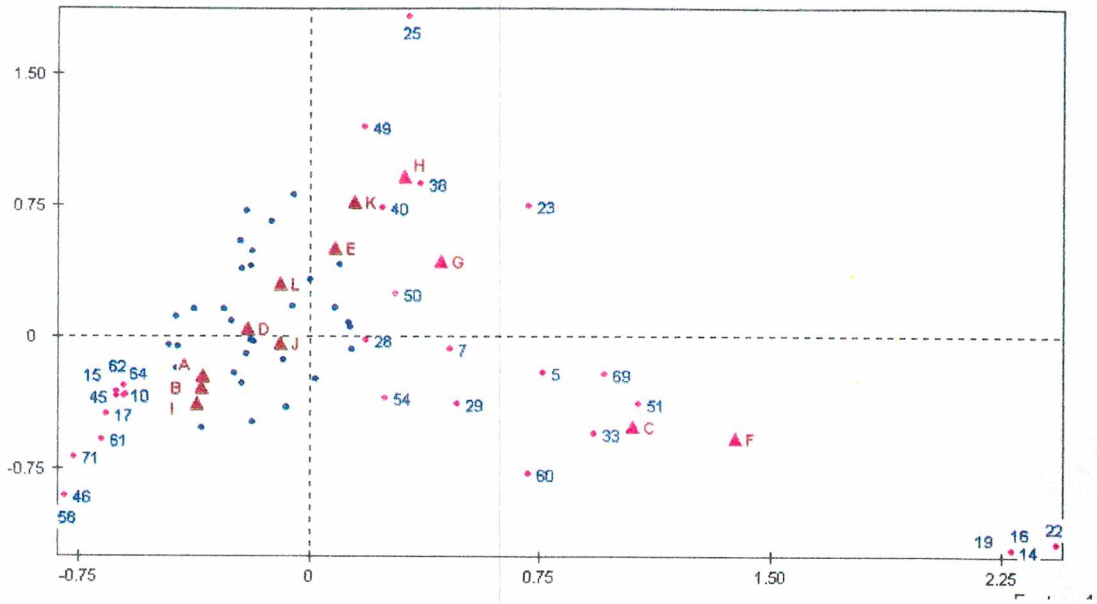
- To compare the choice of strategies profiles of the different subjects, grouping them according to similarities in their choices of strategies;
- To spot sets of strategies that have been preferably chosen by some subjects;
- To check the association between the types of strategies chosen and the groups of students;

The results of the Simple Correspondence Factor Analysis are presented here in the form of graphs, but the choice of strategies profile of each student is shown in

Appendix G. It depicts the percentage of choice of each strategy in relation to the total of strategies used by each subject. Thus, in Graph 1:

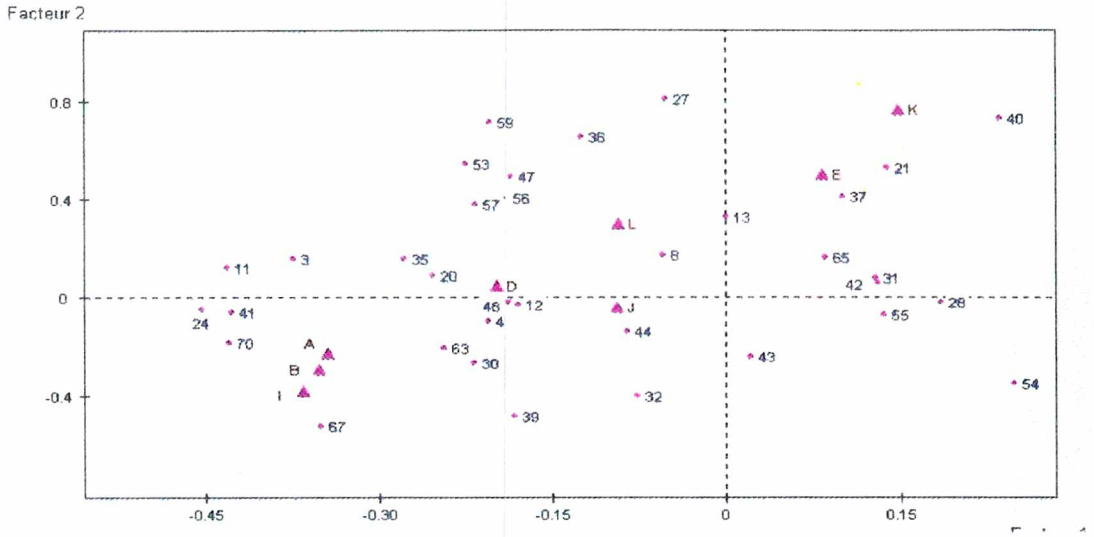
- The subjects that are close present a similar strategy profile. In other words, the proportion of use of each strategy is similar. The subjects that are distant present a different choice of strategy profile. For example, subject A presented a profile similar to subject B's. On the other hand, subject I's profile differs from subject K's.
- The axes intersection (origin) represents the choice of strategies profile of the total of subjects, namely the "mean" profile. Thus, the subjects that are distant from the origin are the ones who considerably differ from the cohort. This is the case, for instance, of subject F. The subjects who are close to the origin do not differ from the cohort and might represent the subjects' typical choice of strategies profile.
- The proximity between the points that represent each of the strategies indicate that they have been chosen in a similar proportion; a bigger distance between them follows a bigger difference in the proportion in which they have been used by the subjects.

Graph 1. Representation of the strategies used by the subjects



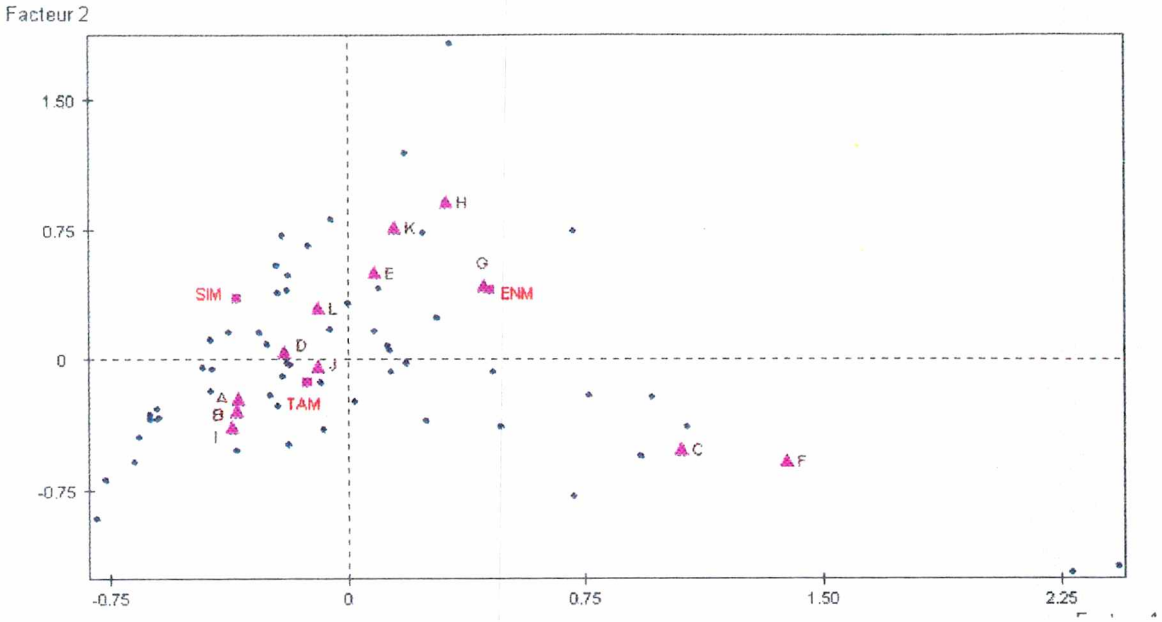
In Graph 1, the strategies are identified by numbers and the subjects by letters. Apart from the comments already made, Graph 1 also allows one to perceive which strategies are associated to which subjects. Thus, for the sake of illustration, subjects A, B, and I tend to preferably choose the following strategies: strategy 70 (*set hypothesis*), 67 (*scan & inspect an area*), 41 (*interpret exploration carried out*), and 63 (*reconsider hypothesis*). This means that they have proportionally been more used by these subjects. Due to the great amount of strategies spotted, it was not possible to label all of them on the graph. Therefore, a zoom (Graph 2) of the central part of it is presented with the corresponding numbering (see also Section 4.2, Table 5 for the full list of strategies spotted and examples).

Graph 2. Zoom of the central part of graph 1, with numbers corresponding to the labels presented in Table 5.



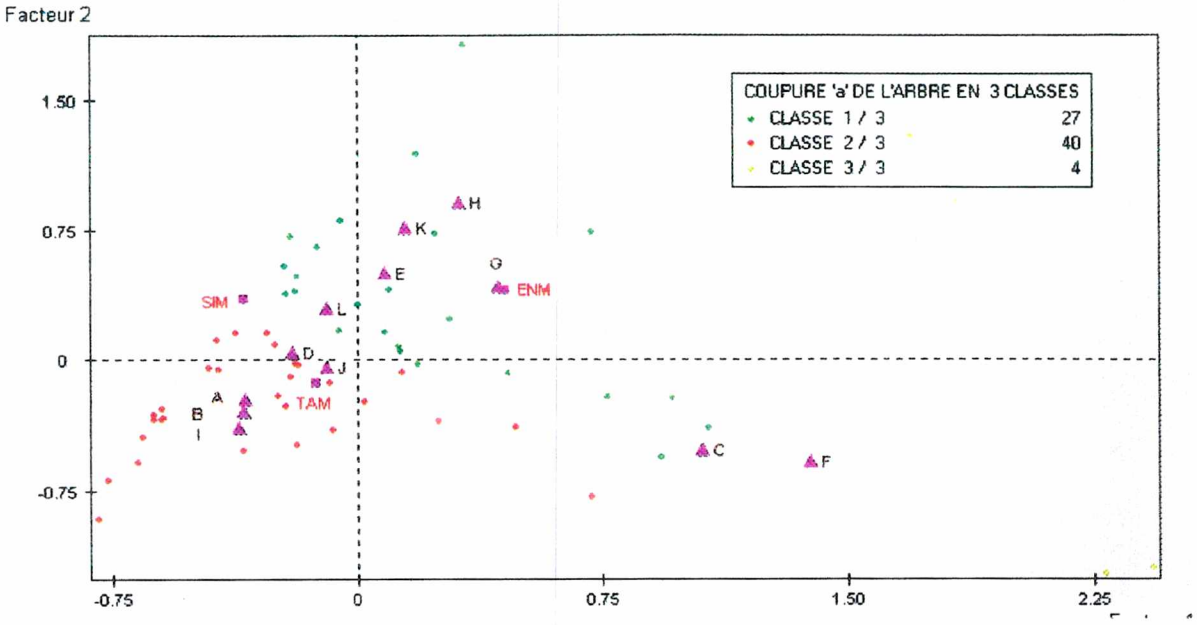
Each of these strategies belong to a predefined model. The representation of these models (Graph 3) permits one to check which subjects are associated to which model. In other words, it is possible to see whether the strategies they have chosen are preferably of the TAM, ENM, or SIM type. As an illustration, it is possible to perceive a clear association of subjects A, B, and I with TAM strategies.

Graph 3. Representation of the strategies, the models, and the subjects



In order to determine the 'classes of strategies' that have been chosen in similar proportion, the Simple Factor Correspondence Analysis was complemented with a Cluster Analysis. This analysis produces three classes of strategies: Class 1, with 27 strategies, Class 2, with 40 strategies, and Class 3, with 4 strategies, as can be visualised in Graph 4. It differs from the previous one as the points that represent the strategies have different colours so that strategies of the same colour belong to the same class.

Graph 4. Strategies and classes they belong to (Identification follows specific colours)



As one can observe on graph 4, class 1 is more associated with ENM as 70% of the ENM strategies belong to this class. The subjects that present this class profile are subjects K, E, H, and G.

Class 2 is more associated with the TAM type as almost 66% of the TAM strategies belong to this class. Subjects A, B, and I are characterised by this choice of strategies profile. Finally, all the strategies that belong to Class 3 are of the SIM type. The subjects that belong to this profile are subjects C and F. Subjects L, D, and J present profiles that cannot be considered typical of any of the classes mentioned previously. They are, so to speak, members of a borderline type as they present similarities not only with class 1, but with class 2 as well.

4.3 The present study vs. source study: Similarities and differences

Except for one of Kauer and collaborators stages, namely *'intention to open door for navigation'* all the other twenty-three additional stages identified by Kauer and colleagues have been spotted in the subjects' verbal protocols of this study. Besides, other forty-eight stages or strategies have been noticed in the subjects' protocols of the current study. Some were refinements of Kauer et al.'s stages and some were additional stages/strategies used by the subjects in this experiment. In general, and for the sake of recapitulation, I would say that the strategies comprised in the Task Action Model could be categorised as, so to speak, 'cognitive strategies', involving mental actions related to reasoning, such as: 'consider', 'deduce', 'hypothesise', whereas the Explore Navigate Model comprised more search/navigational strategies. The System Initiative Model referred to those strategies where the subject attempted some action on the system in order to exert change or control. The results demonstrated that, proportionally, SIM stages have been performed minimally. Causes to that are discussed in section 4.2.

Differently from Kauer and colleagues' study, the concept of *intention* (i.e. a specific action taken to get to a goal) has been fine grained in the current study. Thus, by 'intention' I mean the *purpose* one has to accomplish an action, leaving the term 'execution' to the physical *accomplishment* of the action. Such a distinction was important as on many occasions the subjects declared the intention to do something but reconsideration has made them take different decisions. Let's compare the three verbalisations:

Subject A

Quero voltar prá ver os falsos [cognatos], então. (Intention)

Subject H

Voltei pro 'menu' (Execution)

Subject B

Eu vouentrar no exercício de palavras-chave...Não, eu vou entrar no de conhecimento prévio.

(Intention / reconsideration / no execution)

In Kauer et al.'s work, the '*consider objects*' stage/strategy was found to be a less important behaviour because, as they explain, "little consideration of objects was required" (p. 421). The same cannot be said of it in the current study. In fact, the '*consider*' stage (of content/location/attributes) was one of the six predominant stages accounting for 5.36% of all moves. This might be explained due to the built-in reasoning requirements of the read-to-do and read-to-learn tasks of the application. In this manner, the subjects had to reduce their level of uncertainty by examining the object/ environment thoroughly. Textual strategies, more than only visual ones, were important requisites.

'*Interpret navigation feedback*' was considered a common action in Kauer et al.'s study, while in the present investigation it rated very low (only six occurrences). An instance of this kind of verbalisation is:

Subject I:

Eg. *Não aparece nada...não clica nada...*

The reason for such a low incidence might be adequacy of instructions (i.e. the subjects did not have to reinterpret in order to understand), and navigation

visibility, i.e. the icons were there to flag the paths. The 'end control' stage/strategy was considered uncommon in Kauer et al.'s work. According to them, the subjects used to exit before the guided tour had been completed. In this investigation it was also considered uncommon but for a different reason. This action is included in the Initiative System Model and presupposes that the subject is in control. For reasons previously discussed, there was not always some predisposition for the subjects to take control. Half of the subjects attempted deciding when to quit the application, though after a considerable tour time (more than half of the session). In the *'plan how to take control back from the system'*, the other SIM stage/strategy 18 instances have been identified in the thinking aloud protocol, though there were many more attempts that have not been verbalised.

The *'intention to execute command'* stage was considered common in both studies. In the present study, all the 'intentions' accounted very high (19,14%) and were included in the 'predominant stages group'. Three out of the five 'intention' stages/strategies belonged to the Task Action Mode, one to Explore Navigate Mode and one to System Initiative Mode. The IEC stage/strategy had the second highest occurrence (5,74%) among all 'intentions'.

Finally, Kauer & collaborators have not considered *read documentation* and *problem report* as stages, but mental behaviours occurring concomitant to the actions taken. However, in the current investigation both have been counted as strategies of utmost importance to construct and maintain coherence. Further discussion on how coherence was established and maintained by the subjects along the experiment with the hypertextual application will be delivered in the next section.

4.4 Sources of coherence in an electronic environment

Two macro sources of coherence have been used by the subjects in the current investigation: system-based sources of coherence and subject-based sources of coherence. Both are described and illustrated in the next sub-section.

4.4.1 System-based sources of coherence

Two features introduced by this author in the application may have been used by the subjects as effective sources of coherence: embellishments and navigation patterns. In fact, the introduction of such elements aimed at creating a positive environment to the user and also signalling paths thus helping the user along the navigation.

a) Embellishments

Embellishments are hypertext-based sources of coherence: the layout, the navigational devices used, colours and other visual and sound elements. As there were minimal comments about the devices used, I believe that the headings, organisers, icons to flag navigation and help orientation were appreciated by the subjects, playing effectively the role assigned to them. Some comments were made in the questionnaire on how attractive the application was (*'screen was 'clean'*). Yet, there were also a few negative comments (*'scrolling of screen makes task performance uncomfortable sometimes'*).

b) Navigation pattern

During the think aloud subjects reported the use of the navigation pattern 'menu-node'- 'node-menu' or 'node-internal categories'. There were very few comments on and low use of the local index. Only two of the subjects explicitly commented on them. One noticed its existence a long time after she had been using the general index icon and looked very happy with this short-cut possibility. After that she used it whenever possible:

Subject E:

Eg. *Agora eu vou ver exemplos de conhecimento prévio, sem voltar prá página inicial* (ri) *porque eu descobri agora, bem aqui...*(Ri).

The strategies the participants of this study used certainly had the underlying goal of putting some order to the apparent chaos hypertext provokes, in relation both to the new format of text representation and to the medium where it appears. The old need to organise information, to make sense of the world is still there in the reader's mind:

Subject E:

Eg. *Só que eu queria saber o resto! Ficou pela metade. Tem mais coisa?*

Subject C:

Eg. *Acho que vou em tudo, né, prá ver o que tem que fazer.*

4.4.2 Subjects' sources of coherence

As mentioned before, seventy-one stages/strategies have been identified in the current experiment. No doubt, they represent the subjects' attempts to establish coherence. Some of those stages/strategies were more explicit and more predominant than others and will be further elaborated upon. Apart from them, other items were selected as they have been intensely used by subjects along the think-aloud protocol. Their use reveals the user's emotions, and the necessity to understand and explain things and situations according to his/her own mental model. For the purpose of the present study the term *mental model* follows Norman's (1988) definition and provided for the area of design. Thus, according to Norman, mental models are "the models people have of themselves, others, the environment, and the things with which they interact" (p.17). He adds that "everyone forms theories (mental models) to explain what they have observed" (p.39). A concept very close to Norman's mental models is van Dijk's (1999) *experience models*, that are related to "subjective, unique interpretations of the specific episodes in which particular people participate daily" (p. 127). Indeed, it may be that the subjects, framed by the mental models each of them has developed, have effectively used the following strategies as sources of coherence: a) read documentation, b) interpret, c) construct an emotionally positive relationship with content/interface, d) predict, e) evaluate, f) intentions, g) locate himself/herself in the world, h) check, and i) revise. Some considerations are drawn about each of them.

a) Read documentation

Read documentation was used by the subjects as a strategic instrument to create and maintain coherence, and pace reasoning. While subjects were reading documentation they were also 'taking time' in order to search for explanations. Read documentation was used as a source of coherence and of reasoning and might be seen as the subjects' threshold strategy in order to identify, locate, react and evaluate a problem. It also represented a dialogical device used by the subjects to create interaction with the interface. Pressley and Afflerbach (1995) comment on readers'responses to text as being influenced by personal and cultural experiences as well as by interests and goals. As the two authors point out, readers try to establish meaning by posing questions, explaining events in a text to themselves, judging the text, etc. This, so to speak, direct report speech, finds resonance in text pragmatics (Meurer, 1998) where the central notion of text mediation, with the use of major rethorical organisational features, helps clarify issues, including the understanding of mundane events, as well as organise information coherently. Thus, reading documentation means taking time in order to reason. In other words, the reader seems to give back to the application the responsibility to say something again, to explain something again while he/she 'digests' the information being delivered. Tadros (1985) discusses some organisational features such as reporting, ennumeration, and anticipation used by the writer. In the present context those devices are used by the reader but still fulfilling the role of helping organise the several kinds of relations established among hypertext reader, application and the system. Examples of ennumeration, anticipation, and read documentation are:

Subject E:

Eg. *Agora vou pro exemplo 2...Agora eu vou fazer o 3...Agora eu vou fazer task quatro.*

Subject B:

Eg. *Essa acho que vou errar.*

Eu vou ler o texto...Eu vou ler as opções e você tem que reler o texto: "Indique a área em que o texto se insere: Econômica, política, acadêmica, médica". Eu acho que é política, mas eu vou ter que reler.

One of the most used strategies, Read documentation accounted for 11,49% of all the strategies used by the subjects in the 1567 moves along the application. It seemed a very useful tool to deal with environment complexity as it was used to enhance mental hierarchical decomposition that helps in the pacing of reasoning and interpretation.

b) Interpret

To interpret is a way to retell, recall, analyse and understand situations. It is an adaptive strategy used to reorganise the world in personal terms whenever new incoming information affects comprehension. In fact, it is a way to help explain situations and events and, consequently, reduce the level of anxiety. Differently from the 'Read documentation' strategy, where readers give back to the writer the responsibility to re-explain things, 'interpretation' implies the subjects claiming responsibility for the understanding of the information delivered. Thus, interpreting is an explanatory device used along the experiment to help understanding.

It is well known the importance of explanation in understanding. Graesser, Bertus and Magliano (1995), Trabasso and Magliano (1996), Norman (1988) assert that human beings have a natural tendency to explain things, explanations playing a pivotal role in several theories and models of psychology and artificial intelligence. As Trabasso and Magliano (1996) put it, "an explanation can provide a ground, basis, rationale, motive, idea, condition, occasion, pretext, or the "why" and "wherefore" of events, states and actions in a narrative" (p.259). Van den Broeck, Risden, and Husebye-Hartman (1995) include explanatory reasoning as "the primary means by which coherence in understanding is achieved. In this study explanations have been coded "interpret", and has labelled all the utterances where the subject attempted to paraphrase the original text, the attributes of the target object, or the environment.

Nine out of the 71 stages/strategies were related to explanation (interpretation) (12.67%). They encompassed 105 moves (6,71%) out of the overall 1567 moves. On several occasions when the subjects wanted to extend their comprehension of task requirements, feedback, or even explanations given along the application they used this strategy. This may be evidence of our explanatory nature, our necessity to know the reason why of things in order to establish and maintain coherence. Here are two examples:

Subject I:

Eg. *Ah, tá, entendi. Tenho três* (títulos) *e tenho quatro textos. Tá.*

Subject B:

Eg....*o texano não entende o que é escassez porque eles criam, o russo não entende o que é carne porque lá é escasso e o nova-iorquino não entende o*

que é 'excuse me' porque eles não estão acostumados com essa gentileza toda.

b) Construct an emotionally positive relationship with content/interface

The unconscious attempt to create affective bonds with the application / machine have been noticed specially by two of the non-knowledgeable subjects. Thus, there was the use of possessives ('**my** menu'); personal pronouns ('**he**' [the application/machine] is kidding me); verbs indicating mental actions (*'he is **encouraging me**'*; *'he is **rejecting me**'*) where a positive and explicit interactional behaviour is established.

d) Predict

The attempt to predict could also be viewed as a way to reduce uncertainty. According to F. Smith (1981), the reasons why we predict are related to our attempts to avoid or prevent specific bad things that we think may happen in the future, to get rid of ambiguity, and to eliminate unlikely alternatives and, therefore, avoid feeling overloaded. Thus, during the experiment, the moment the subject creates certain expectations he/she seems to be anticipating results and these results (usually connected to "something bad") will not catch him/her unaware. In other words, he/she will have some time to "get prepared" to re-arrange things if the unexpected or unavoidable comes to happen. This certainly lessens the feeling of frustration. In short, it is a strategic behaviour: one needs a 'B' plan to re-create

coherence in case things go wrong. This is compatible with Trabasso and Magliano's (1996) recent studies where they demonstrate that predictions may be generated to 'resolve a coherence break' (p. 260).

Three stages related to predictions have occurred in the think-aloud protocols that accounted for 4,22% of all stages, with one subject being responsible for half of the ten occurrences (0,63%). Except for one occurrence that was related to an attribute of the system, all of the other predictions were content-related, which might mean that in general the format was not a major source of ambiguity or anxiety. Some examples:

Subject B:

Eg. *Essa tem que tá certa...*

Acho que nem adianta tentar corrigir...

Não vai servir muito, mas...provavelmente...

Subject I:

Eg. *Pois é, vai sobrar e eu não concordo com nenhum deles.*

Subject L:

Eg. *Não, mas mesmo numa tela grande você vai ter...*

e) Evaluate

Pressley and Afflerbach (1995) acknowledge the relative scarcity of self-report studies that included evaluative remarks. They hypothesise that "analyses in many think-aloud studies were not sensitive to evaluative processing" (p. 79).

Conversely, in this study evaluative features occupy a prominent position. Evaluative elicitations are folded into interpretive/explanatory strategies used to help diminish, for instance, possible feelings of anxiety.

Compatible with Pressley and Afflerbach's study mentioned before, several instances of evaluative reactions have been spotted in the analysis of the think-aloud protocol used in the present study: skepticism, comments on topics, overt affective responses (positive: satisfaction, surprise, laughter, puzzlement), and negative responses (boredom, frustration, swearing), approval / disapproval of characters, places, circunstances in a story or article. For the purpose of this investigation such evaluative reactions have been encompassed in two umbrella terms, namely self-evaluative and system evaluative, according to the features focused by the subjects.

Self-evaluation: Self-evaluation is a form of explanation that has been occasionally used along the think-aloud protocol by some subjects either for emotion purposes (praise, for instance), when things corresponded to the experience model anticipated by the subject, as in the following example:

Subject L:

Eg. *Humm...tô bem!*

or as a cognitive 'saving face' strategy, i.e. as an excuse to help cope with the mismatches between the subject's answers and the application. Two kinds of causal explanations were used in the current experiment as an attempt to put blame for failure: a) cognitive sources, as when the subject blamed himself/herself for a mistake made:

Subject I:

Eg. *Ah, já vi, sim. Tô doida.*
Ah, é, claro, eu tô ficando besta...é, eu tô ficando louca.
Ah, tô cega!
Ah, que burra, que burra!
Como é que alguém faria...não conseguia achar...que coisa!!!
Esse negócio...eu olhei a coisa...eu sempre esqueço o que vem atrás, eu faço uma bagunça, um pastel. Se eu tiver um papel eu leio, não é...

Subject K:

Eg. *É...se eu imaginasse que não soubesse, eu acredito que...leria a explicação*

Subject J:

Eg....é que eu não conheço muito...essa palavra *labor* eu não conheço...

Here the argument goes this way, as put forward by Norman (1988): "If we believe that others are able to use the device and if we believe that it is not very complex, then we conclude that any difficulties must be our own fault" (p.40); and b) interface sources, as when the subject blamed the system for his/her difficulties:

Subject I:

Eg. *...those small letters...*
Não, é nervosa não é por causa do teste. É por causa do tamanho da letra.

Such utterances remind us of Oxford's 'affective and metacognitive (self-evaluation and self-encouragement)' strategies discussed earlier in this study. Subject I's reactions, for instance, reflect some personality traits where everything seems to be very intense. A learning style congruent with it would be perhaps Honey and Mumford's *Activist* category, or Kolb's *Assimilators* mentioned in section 2.6.

As for the positive and negative reactions to the application/machine the assumption would be that the subject felt free — more than in traditional instructional environments — to express frustration, discouragement, or fun with the same intensity and passion. As Schofield and collaborators (1994) admit in their case study, this kind of reaction is only possible because there is the implicit guarantee that no strong social norms are being violated. Machines do not get hurt or demand respect, as it would be expected in interactions directed from students to teachers.

Evaluate the system: Human beings need causes and like to explain things based on those spotted causes. That is a way to create coherence. Along the experiment the system was evaluated emotionally and technically, an attempt perhaps to justify likes/dislikes, conformities and non-conformities. Let's examine the following examples:

Subject L:

Eg. *..Ah, essa barra...ela fica...tem horas que você precisa usar muito, né, então prá você fazer, responder uma questão, você precisa ficar subindo e descendo nela.*

Você não consegue visualizar tudo na tela.

Subject B:

Eg....*esse teclado é diferente do meu...*

...é o tipo da letra que dá a impressão...

Subject D:

Eg.: *...Então, no caso da tarefa 1, devia tá aqui 'fim', né, alguma coisa que você pulasse prá tarefa 2. Porque como é que você...Tinha que ter um...coisinha de... 'próxima'.*

Subject A:

Eg. *...não tô muito feliz nessa...*

Subject J:

Eg. *...mas é muito legal isso aqui...muito bom.*

f) Intention to approach target

Very much used along the verbal protocol, this strategy signals that a plan is on the way. Coherent actions seem necessarily to follow this 'planning' pattern. Another example from the corpus illustrates this category:

Subject C:

Eg. *Agora vou prá outra parte, então.*

g) Locate himself / herself in the world

On-line connections with real life situations have been attempted by the subjects in order to create familiar patterns that could anchor or nest new information.

Subject C:

Eg. *...agora vou pros exercícios de palavras-chave. Ah,...na minha área de atuação...Bom, já que eu tô trabalhando numa pesquisa sobre petroquímica, então, 'petróleo'.*

This familiarisation strategy gives the subjects the feeling that the environment is not hostile and that finding correspondences can help in the comprehension and integration of new information. Thus, retrieval from concepts and situations that the

user has gone through in other real life situations or from earlier cycles in the same situation may help diminish anxiety and establish coherence.

Though having a low frequency, attempts to connect information in the application with other disciplines or ways of behaving in real life situations have been used by ten out of the twelve subjects. They, again, remind us of Oxford's (1989) *memory strategies.* Here is an example:

Subject J:

Eg....*nas provas já tô vendo bastante isso assim...*

...ah, igual ao que a professora passou prá nós.

h) Check

Immediate feedback was very much used in the context of the present study. As they were dealing with an unfamiliar environment, subjects wanted to know if they were following the right track so that they could strengthen his/her mental model or, conversely, pursue remedial work. For instance:

Subject E:

Eg. *Os acertos são os verdes, né?*

Acho que só pode ser uma resposta aqui, né?

Agora eu vou corrigir de novo, vê se eu acertei..(Acerta). *Agora deu.*

i) Revise

According to Kintsch (1998), "revising a text for coherence is [ ] an effective technique to further understanding and learning" (p. 312). This seems to be true in electronic contexts too. In the think aloud of the current investigation this revising occurred in two different ways: compulsorily, due to navigational loopings *'Ah, volta pro menu, mas eu não queria voltar pro menu...)*; and intentionally, when the subject wanted to be sure he/she had traversed all the tasks. Subjects B, J, and I were the ones in the latter case.

Subject B:

Eg. *Só prá lembrar...eu vou entrar nos exercícios do conhecimento prévio...*
...exercícios...isso aqui eu já fiz...eu ainda não fiz o 2...Vou entrar no exercício 2.

The resources created by this author to create coherence and, therefore, enhance text and comprehension (examples, notational, illustrative, or even instructional) are not as important as the strategies developed / adapted by the subjects themselves to create and maintain coherence. This, so to speak, adaptive state of mind seems to be of tremendous importance in not very familiar environments.

4.4.3 Breaks in coherence

When a text seems not to make sense the break in coherence could be attributed either to the non availability of textual, or interface features that provide

for coherence, or to the reader's lack of capacities (prior knowledge, or adequate strategies, for instance) to provide for it. Here they are categorised as system-based sources of break in coherence and user-based sources of break in coherence, respectively. A brief discussion of some of those sources of break in coherence indentified in the verbal protocols is conducted below.

a) give up on a task

This stage/strategy represented the result of mismatches between the subject's efforts and successful accomplishments. The protocol elicitation referred to the subject's view of unmanageable problems, or manageable but requiring more information that could be achieved along following screens. This 'quitting' strategy demands the integration of new information to provide the necessary context for the resolution of the task, when then, coherence would be re-established. It could also reflect the subject's low level of commitment, or represent shortcuts in order to accelerate the experiment. The *give up on a task* stage/strategy represented 1,46% of all moves. The following example was found in the corpus:

Subject B:

Eg. *Então eu vou sair do exercíco de Conhecimento prévio.*

Subject L:

Eg. *Vou ver outra coisa.*

c) Problem reports

Problem reports may represent the subject's reaction to mismatches of different sorts: content / interface / negative emotions, or a sign of overload, weary, boredom, disorientation, etc., and demonstrate that coherence somehow has been broken.

In like manner, the first step towards solving a problem is to acknowledge its existence, identify its location, react to it. Thus, problem report may also be viewed here as a strategy to search for coherence in the electronic context. In the experiment, Problem Report has been categorised following my own terminology as: *Related-to-content problems (RC)*, *Related-to-navigation problems (RN)*, and *Related-to-attributes of the system problems (RAS)* (Table 9).

Table 9. Types of problem report identified in the think-aloud protocols

PROBLEM REPORT													
Subject→	A	B	C	D	E	F	G	H	I	J	K	L	TOTAL
RC	3	4	2	2	6	2	1	-	8	9	-	1	38
RN	-	2	1	6	1	-	-	-	1	2	1	2	20
RAS	-	4	-	1	-	-	-	-	5	-	-	2	12
TOTAL	3	10	3	9	7	2	1	-	14	11	1	8	70

As can be viewed in Table 9, RC concentrates the highest incidence of reported problems. This might mean that it is not the format, as one would expect, the main source of difficulties, but the content knowledge. Some examples of problem report categorisations are:

Subject B:

Eg. *Cadê o acento, não tem tecla de acento?* (RAS)

Subject C:

Eg. *Não entendo o porquê da expressão.* (RC)

Subject D:

Eg. *Apaga tudo...gozado...* (RAS)

Subject E:

Eg. *É...ai meu Deus...* (RC)

Subject B:

Eg. *...é, quando eu pedi 'explicação' caiu também na mesma página* (RN)

It cannot be said that there was no disorientation caused by the system. However, instances of it have not been easily found along the think-aloud protocols. The ones spotted were much more related to rhetorical issues, as when someone is saying something just to take time before deciding where to go. Such a strategy is ussually necessary when there is a reasonable array of possibilities. In the application, the subject could go forward, backward, do nothing, revise, explore the navigation bar, jump sections, etc. The positive aspect is the decision-making process the subject was going through.

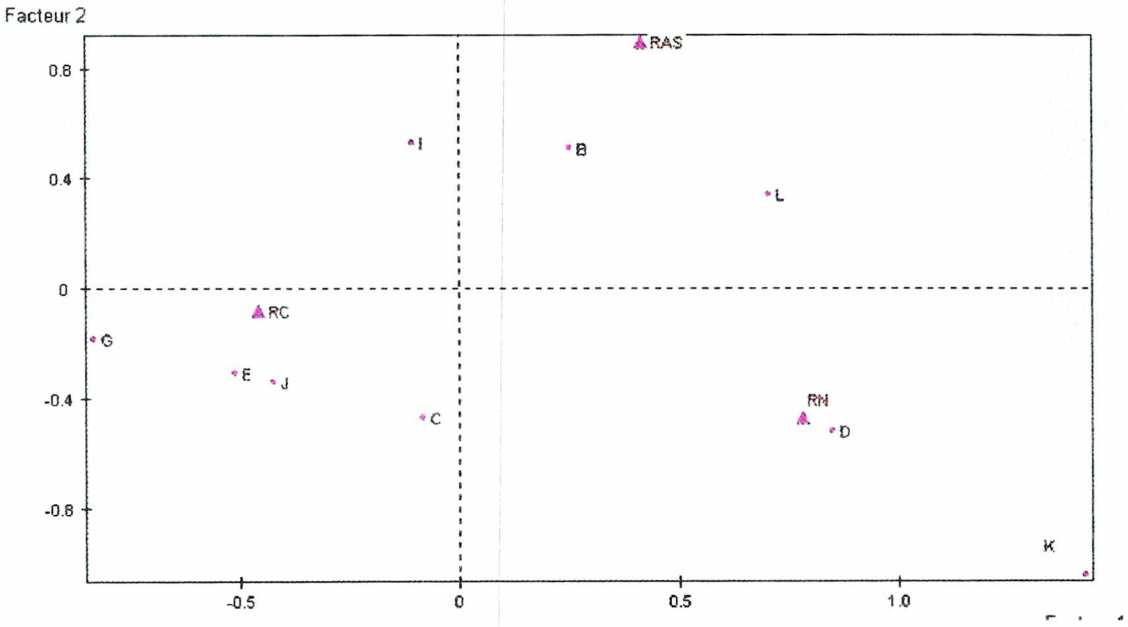
Subject L:

Eg. *E agora, não sei o que fazer.* (RN)

As subject L was categorised as a knowledgeable user, her apparent disorientation should be interpreted as a 'taking time while reasoning' strategy.

In order to study the profile of the types of problem presented by the subjects, a Simple Correspondence Factor Analysis was undertaken using the data provided

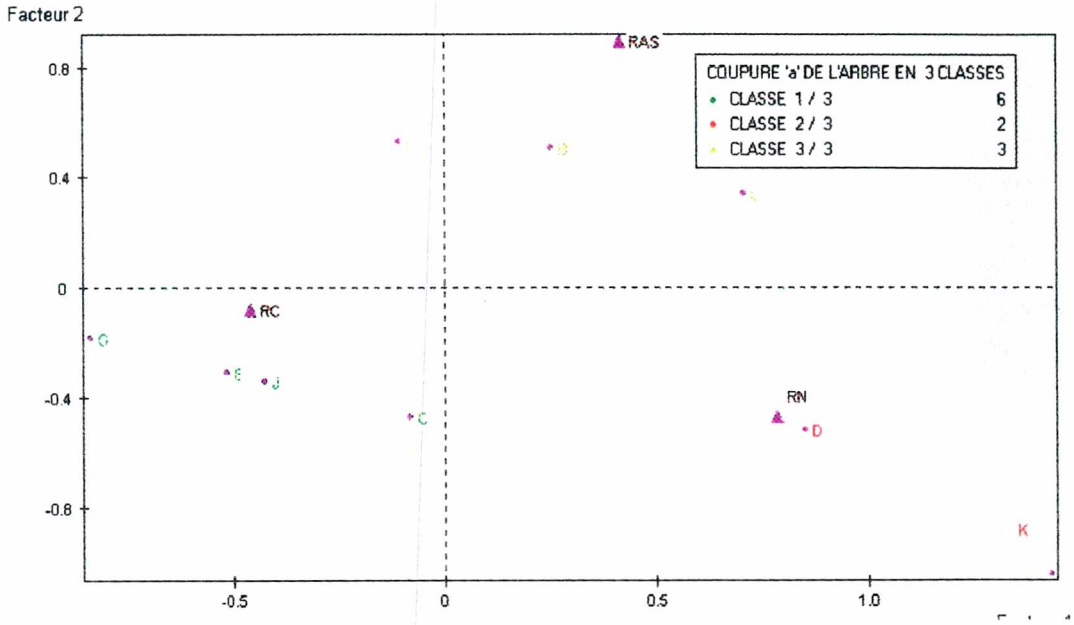
Graph 5. Subjects' choice profile and the types of problem reports



by Table 9. In graph 5, the subjects who are close have a similar problem report profile, whereas those who are distant present a different profile as far as problem report is concerned. For instance, subjects G and F presented the same problem report profile, with their representation occurring on the same point; on the other hand, subjects E and J had a similar problem report profile. It can be noticed that subjects G, F, E, and J are more associated to problem report of the RC type, subjects D and K are associated to problem report of the RN type, and subjects B, L, and I are related to problem report of the RAS type.

The Cluster Analysis was also used to classify all the subjects according to the problems presented. Graph 6 is similar to Graph 5, but it identifies, with different colours, the classes in which the subjects have been grouped.

Graph 6. Subjects and the class profile



The subjects of Class 1 presented a high proportion of the RC type problem report if compared with the cohort and no problem report of the RAS type. Class 2, on the other hand, grouped the subjects who presented a high proportion of problem report of the RN type. Finally, Class 3 concentrated the subjects with a high proportion of RAS problem report.

4.5 Some associations

➢ Read documentation and Problem report

Those subjects who did not use *read documentation*, or used it at a minimum were also the same who attempted to control action, i.e. decided they had seen enough and wanted to quit the application (subjects E, F, G, H, K, and L). They were also the ones with the lowest number of overall moves (F: 69; G: 51; H: 51). Subject K had a little bit more (106 moves) than the established borderline of 5% in relation to the total of moves. Possibly these subjects tended to have low standards for coherence, and were interested in minimal comprehension. These subjects belonged either to the *knowledgeable* or *expert users* group and could possibly be included in Honey and Mumford's Pragmatists, or Kolb's Divergers category.

The high incidence of r*ead documentation* moves, on the other hand, may foreshadow the existence of problems. In fact, subjects B, I, and J (see Table 10)

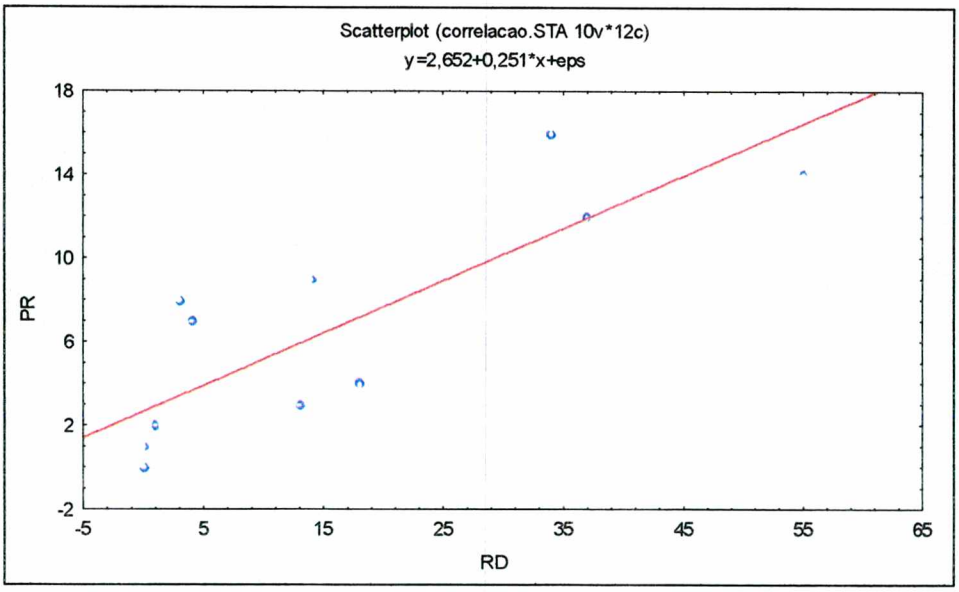
Table 10. Read documentation & Problem report

	Number of occurrences	
Subject	RD	PR
A	18	4
B	34	16
C	13	3
D	14	9
E	4	7
F	1	2
G	1	1
H	_	_
I	55	14
J	37	12
K	_	1
L	3	8

rated the highest amount of both items. Thus, it might be fruitful to juxtapose these two pointers. In order to find support for this assumption a correlation between *read documentation* (RD) and *problem report* (PR) was undertaken.

In order to verify the association between RD and PR, Pearson correlation was attempted. However, it proved ineffective as the data were not in a normal distribution. Looking for a more adequate coefficient, then, Spearmann correlation was used. The results obtained were r = 0,8858 and p= 0,0001. The conclusion was that there was a strong and symmetric association between RD and PR in the sense that the incidence of *read documentation* strategy followed that of *problem report* (See Graph 7). Appendix M shows the graphs illustrating the distribution for Problem Report and Read Documentation.

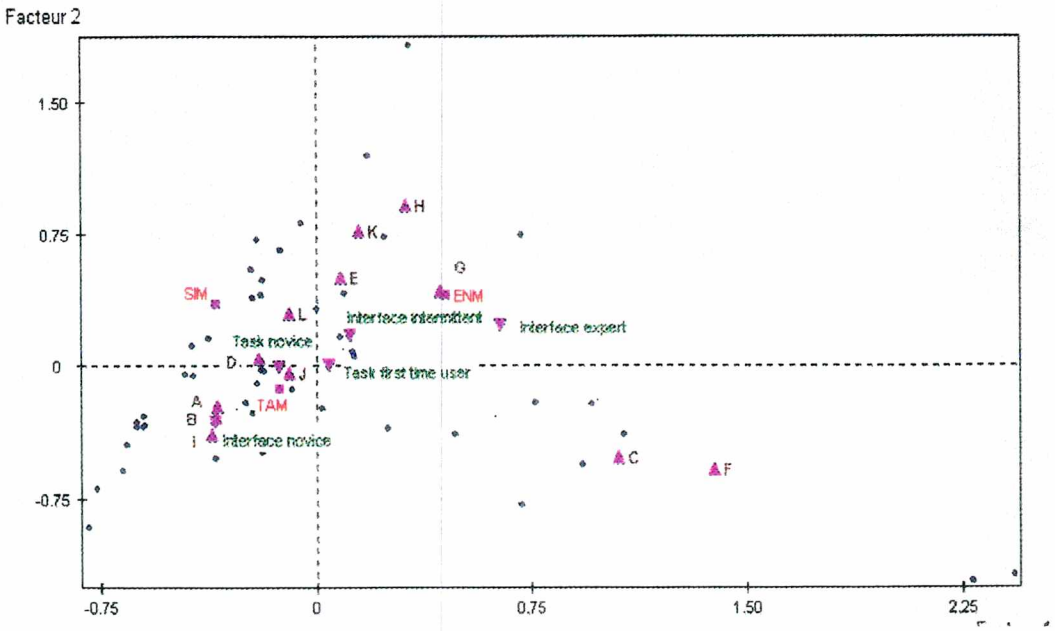
Graph 7. Results of the correlation between RD and PR



➢ **The choice of strategies profile and the subjects' expertise**

Another aspect observed was that subjects categorised as interface domain true novices, like B and I, and subjects categorised as task concept true novice, like subject J, had the highest incidence of moves. This finds resonance in Van Den Broeck et al.'s (1999) discussion about individual differences in reading comprehension and standards for coherence, and the literature on individual literacy and cognitive learning styles revised by Leu (2000), as well as the literature on background knowledge. Thus, subjects B, I, and J seem to require thorough understanding of the text, with very demanding standards for coherence, slow reading and "extensive recruiting of background knowledge or information from the mental representation that has been constructed so far" (p.91). For instance, subject

Graph 8. Choice of strategies profile of subjects according to their expertise



J has acknowledged in the post-questionnaire that his reading had become slower in the electronic environment. On the other hand, subject B has attempted to overcome the system without updating patterns, i.e. by the use of hardcopy patterns, confirming Oostendorp and Bonnebaker's (1999) conclusion that "the influence of old information is hard to neutralise" (p.328). Probably knowledgeable or expert readers must have attempted pattern-updating and non-knowledgeable readers have not done the same.

This is also in accordance with Kumbruck's (1998) literature review on the cognitive benefits of hypertext. The examination of a small case study compared hypertext novice vs. expert reading. The results point to hypertext advantages but with reservations. One of them is related to background knowledge. She reports that readers with a poor background knowledge (novices) have more difficulty in dealing with hypertext, therefore they need much more guidance than experts do. She also claims that experts profit more from hypertext in terms of topic accessibility, and they adapt more easily to situations as they have no specific way of reading application.

The expertise of the subjects was categorised as true novice, first-time users, knowledgeable intermittent, and experts, as discussed in Section 3.1. This categorisation considered two aspects: task domain and interface domain. Graph 8 provides a comparison of the choice of strategies profile of the subjects who presented different levels of expertise.

If the Class categorisation put forward previously is called up again, the following comments could be made: Class 2 is more associated with the choice

profile of students with interface novice characteristics; class 1 is more associated with the choice profile of subjects with interface expertise or who are knowledgeable intermittent characteristics; and class 3 is associated with the choice profile of students with task first-time user characteristics.

CHAPTER V

HYPERTEXT AND AFFECTIVE ISSUES

5.0 The secondary queries

This chapter aims at presenting the results related to the second query raised in the present study. The second research issue was divided into two parts: a) whether reading motivation was enhanced with the use of a hypertext format; and b) whether the use of a hypertextual unit caused any overloading. A qualitative method was drawn upon — a specially designed questionnaire (see Appendix E) — in order to account for the attitudes of the subjects to a hypertextually-formatted learning unit. The analysis of the data also provided some clues to resolve the overloading issue.

5.1 Motivation: Some results

Much research has been concerned with motivation, its sources, how it influences learning, how it can be enhanced. The term *motivation* encompasses different things to different people. As mentioned in section 2.6, motivation is viewed in the present investigation as 'the engagement for doing things'. In order to find how much the hypertextual application has triggered the subjects'engagement to accomplish it, a post-test questionnaire was used. A summary of the results of the post-test questionnaire is reported in Table 11.

Table 11. Summary of results of the post-test questionnaire

Question	Percentage
2. Task performance was faster with the hypertextual format	83%
3. Format is responsible for the speed	83%
4. Increase in the level of commitment with the tasks	75%
5. High level of satisfaction with the hypertextual format	66.6%
6. The format was very adequate	66.6%
7. Respondents felt relaxed while using the hypertextual unit	58%
8. Format fairly stimulated accomplishment of tasks	58.3%
9. Wish to use the format at least in some disciplines of their major courses	50%
10. Respondents felt they had the control of the tasks	50%
11. Multimedia resources responsible for the increase of commitment	42%
12. Lack of previous knowledge was the main cause of task difficulty	42%
13. Respondents felt their performance would be good no matter the format	41.6%
14. Pperformance would be worse in the hardcopy version	31%

The results of the post-questionnaire are promising: it provides evidence for the confirmation of the second query put forward in the current study. Despite the low number of participants (12), the results might evoke a trend in the predicted direction, namely that the users perceived the hypertextual format as a source of enhancement of motivation (75% of the respondents said so).

The answers demonstrated a clear feeling of satisfaction with the use of a hypertextual unit. The results of the questionnaire established that 66.6% of the subjects enjoyed the experience of working with hypertext (question 6 of the questionnaire), a result that could be cross-checked by analysis of the transcription of the think-aloud protocol. This is also confirmed by the item related to the perceived usefulness of the format (question 2): 50% of the subjects would like to use the hypertextual format at least in some of the disciplines of their majors.

In the questionnaire, 58.3% of the subjects acknowledged feeling *'fairly'* motivated as a result of the format, and 41.6% acknowledged feeling *'very motivated'* to perform the tasks of the hypertextual module (question 7).

The level of commitment focused in question 8 was interpreted as related to engagement /attention / concentration. They are reported to have been increased with the format by 75% of the subjects. The reasons pointed out were the multimedia appeals (sound and image) present in the application.

As for the perceived efficacy (question 4) of the format, 50% of the respondents reported a feeling of having the control of the tasks and 30% rated an increase in self-monitoring.

Eighty three per cent of the subjects reported positive perceptions on speed (*'faster'*) (question 10).

The perceived easiness of use (question 1) of the format was rated as *'very adequate'* by 66.6% of the subjects.

Fifty-eight per cent of the subjects acknowledged feeling relaxed all the experiment long, while only 16.6% acknowledged being slightly tense in the beginning, though relaxation had increased as the experiment went by.

Only 25% of the respondents acknowledged their performance as being better in hardcopy if compared to hypertext, while 41.6% believed their performance would be good in either format (question 5). Eighty percent of this group had been categorised as either intermittent knowledgeable users or expert users; only 20% belonged to the non-knowledgeable category. This could lead to the conclusion that knowledgeable readers are immune to format variation. This corroborates Boekaerts' (1997) conclusion that knowledgeable individuals "in a domain of

expertise can self-scaffold their knowledge acquisition process allocating sufficient resources to knowledge extraction and to various monitoring processes"(169). This means that they probably did not consider either format as directly responsible for their successful performance. In this same question, four subjects (33,3%), scattered amidst the novice and knowledgeable categories, reported that their performance would be worse in the traditional format. In this case it seems that the format might have been perceived as responsible for possible successful accomplishments.

5.1.2 Discussion

Except for two of the subjects who accomplished their tasks without almost any comment, all the others maintained a reasonably intense level of interaction with the researcher aiming at solving content problems, navigation doubts, or just sharing the feeling of being using a new format. There was also a considerable personal level of interaction with the interface/application, with some of the subjects attributing personal reactions to the machine/application, as it has already been discussed. This corroborates Oxford's works on language learning strategies. As an example, some of the findings that result from the analysis of subject B's verbal protocol are shown below:

Subject B:

a) level of expectancy (i.e. a person's subjective estimation of the likelihood of successfully performing a particular behaviour). This is an example:

Eg. ... *eu vou ter que acertar*

Eg. ...*vou reler o texto prá procurar outra palavra*

b) instrumentality (i.e. a person's subjective estimation of the likelihood that a particular behaviour will be rewarded). The following examples illustrate the category:

Eg. *Sou aluna da primeira fase, não vale rir* (Rimos)

Eg. *Vai ser divertido prá ver as respostas*

c) valence (i.e. the positive or negative value that a person places on a reward). For instance:

Eg. ...*dessa vez eu vou prá explicação antes do exemplo!*

Eg. *Ah, se eu for fazer uma prova, só vão botar os falsos...*

(This comment possibly demonstrates some frustrating personal previous academic experiences!)

Eg. *Vou escrever em português, assim eu não erro*

These examples give evidence of a highly intrinsically-motivated student, with data resonating Vroom's Expectancy model, used by D. Hancock (1994), whose main tenet refers to the relation 'efforts made versus value people give to the outcomes'. Subject B's behaviour seems also to be in line with Kintsch's (1998) hypothesised *zones of learnability*, an analogy, as he acknowledges, to Vygostky's *zone of proximal development.* Thus, the congruent level of task difficulty must have

created the adequate knowledge overlap to the stimulation of active processing. As a result, there must have occurred the arousal of a feeling of accomplishment and learning.

No doubt, subject B has attributed an 'exam-like purpose' to her dealing with the hypertextual experience. Her reading behaviour all the experiment through is consistent with Pressley and Afflerback (1995)'s claim that readers may react to difficulties in understanding a text by "treating the process of establishing meaning as an exercise in problem solving, requiring probing analysis of text and posing of numerous questions (...)" (p. 84). It is also in line with Lorch and collaborators (1995) who assert that in such situations "readers read slowly, with a great deal of testing for understanding and use of supports, much rereading, close attention to major points and good concentration" (p.385).

At the same time, the difficulty of the tasks seems to have produced positive reactions on subject B as she verbalised the intention not to give up. In this specific case, it seems that there was an effective matching between the subject's zone of learnability and the hypertextual tasks provided. In fact, the whole situation might corroborate Kintsch's (1998) and other studies about the capacity of cognitively demanding tasks "to stimulate active processing, with the result that a more elaborate, better integrated situation model will be constructed" (p.322).

Subject B's elicitation could also be used to illustrate the intense relationship created with the application and the learning opportunity it provided. That can be perceived in the enormous engagement with task performance. Her level of engagement could be noticed when

→ she complains friendly:

Eg. *Ah, sacanagem, ele não obedece à mesma posição das palavras*

→ she comments on the system feedback:

Eg. *Ele me rejeitou as três!*

Ele tá me incentivando

→ she attempts to control the situation:

Eg. *...então eu vou mudar*

→ she tries to overcome the system:

Eg. ...e*u vou ter que corrigir prá ver se ele preenche prá mim*

→ she creates expectations in relation to system feedback:

Eg. *...agora ele vai me vaiar*

→ she interprets system feedback:

Eg. *...acho que ele tá de sacanagem comigo*

→ she capitalises on past experience

Eg. *...dessa vez eu vou prá 'explicação' antes do 'exemplo'...*

→ she creates a sense of ownership of system / content features:

Eg. *...o meu menu*

...a minha palavra chave

...o meu inglês

→ she reflects on her own cognitive process (hopefully aiming at improving her learning)

Eg. *...você trouxe dez fitas, né, porque eu fico...*

...não desisto, sou teimosa

Subject B was the one who scored the highest amount of total moves (269), and the highest amount of 'reading documentation' stage / strategy (34) and 'problem report' stage/strategy (16). This might evidence her own way to deal with the situation (learning style). However, in any moment she seemed bored or discouraged. On the contrary, in spite of her high rates both of RD and PR, she evoked self-interest and self-motivation to persist at task resolving. The impression was that subject B was happy to be there participating and learning. In fact, she reported in the questionnaire feeling relaxed all the experiment long and considered that the tasks were easier to accomplish due to the format used.

Yet, level of congruency, as has been noticed by a number of researchers, is not easy to achieve as natural mismatches related to levels of expectation and previous knowledge in relation to a particular topic may occur. In other words, it may be that the 'notion of cognitively authentic learning experiences', that embraces the triad credibility, complexity, ownership mentioned by Squires and Preece (1999) in relation to softwares, has not achieved some subject's desires / needs as has achieved subject B's. Cognitively authentic experiences are the ones where the learner could feel an environment that

- offers credible opportunities for learning by exploring the behaviour of the system, environment or artefact;
- provides intrinsic feedback, which represents the effects of the learner's action on the system, environment or artefact;
- provides mechanisms for the learner to express personal ideas and opinions.

Subject F seems to be a typical instance where the level of congruency did not work satisfactorily. He was allocated in the 'expert' category (see Table 7, section 3.1) both in terms of interface concepts and content concepts. This apparently placed his zone of learnability out of reach. There was too much overlap producing low expectations and low learning activation. This seems to confirm studies reviewed by Kintsch (1998) that postulate that readers with good domain knowledge might be better active processors, therefore reacting with a certain degree of weariness or impatience before tasks they perceive as not providing 'aggregate value'. Therefore, software designers, researchers, and teachers should be aware of individual differences as they are considerably important in electronic environments too.

5.1.2.1 Subjects' comments

The positive and negative points acknowledged by the subjects in relation to the hypertextual application experience (questionnaire, question 13) are summarised in Tables 12 and 13. Overall the comments were made around usability and motivational items.

Table 12. Positive Points of the format as pointed out by the subjects

Positive Points	Categorisation
It's more **enjoyable**	**(satisfaction)**
It's **faster**	**(speed)**
More **attractive**	**(satisfaction)**
Directed and kept my **attention** to what I was reading only	**(usability)**
Automatises tasks	**(usability)**
Motivated me to use the computer	**(motivation)**
Multimedia resources helps **learning**	**(motivation)**
Ease of use (helps to call the students' attention)	**(usability)**
Faster	**(speed)**
More **interesting**	**(satisfaction)**
Faster search stimulates learning	**(speed, motivation)**
More **stimulating** to learning	**(motivation)**
Keeps the student's **attention**	**(motivation)**
Helps to **accelerate** tasks	**(usability & speed)**
Makes tasks more **objective**	**(usability)**
Helps to **learn** more **English**	**(motivation)**
Helps to learn more about computers	**(motivation)**
Succinct	**(usability)**
Practical	**(usability)**
Immediate fedback & more control	**(usability & autonomy)**
'Clean' screen	**(layout)**
'Mapping' buttons present in all screens	**(usability/navigation)**

a. Positive comments

The positive comments made in the questionnaire may indicate that the hypertextual experience was viewed as 'intellectually challenging' helping the subjects to learn about both English and computers (33.3%); that it was an enjoyable, interesting, attractive, stimulating experience (25%); that performance is faster (33.3%); that the format is practical, succinct (8.3%), etc.

In general, it seems that it is the users' perception that the hypertextual format shows learning gains in relation to the traditional hardcopy format for its fast search and retrieval possibilities, for its immediate feedback, for the user's control it provides. In fact, usability features and speed were the most mentioned items suggesting that they might lead to an increase in motivation, and consequently of learning gains. One user's opinion established an explicit association between fast search, retrieval features and fast learning. It is also clear that they considered the multimedia appeals a very strong point to enhance motivation and learning.

Control seemed to be another advantage perceived by the subjects. Fifty per cent of them acknowledged that they had more control over their tasks with the use of the hypertextual format (Questionnaire, question 4). A comment made by one of the subjects (Questionnaire, question 12) reinforces such a view. The subject stated that the format is positive because *it provides feedback without the need of having the teacher around.* This feeling of empowerment and control has been the focus of several and controversial discussions in the area of electronic reading.

b. **Negative comments**

On the other hand, negative points (Table 13) have included comments about the necessity to increase those multimedia appeals. This might strengthen the users belief that sensorial appeals partly explain their perception of motivation enhancement when the hypertextual format is being used.

One subject considered the format tiring and time consuming if compared to the traditional format. It might be due to the subject's lack of familiarity with the

format and/or content. If it was the case then the user had to make extra efforts to accomplish the tasks. This probably has overburdened him/her. In addition, evidence can be found in the literature (Berquist, 1997) suggesting that processes that demand strict monitoring and control require more energy and attention with the consequence of slowing down processing. Novice users, then, were likely to be the first affected by the lack of interface expertise deficit. Reed and colleagues (2000) also comment on the relationship between the learning style (field-dependent, mixed, or field-independent) and time spent on task. According to them, field-dependent users spend more time on task than those identified as field-independent.

Table 13. Negative points of the format as pointed out by the subjects

Negative Points of the format	Categorisation
Need to use the **scrolling bar** sometimes makes the task performance more difficult	**(usability-navigation)**
Possibility of **immediate feedback** makes us think less	**(usability)**
Discomfort with the **size of the font**	**(usability)**
Not very **attractive**	**(motivation)**
More **previous knowledge** about the format required	**(usability)**
Tasks should be provided with **clearer instructions**	**(usability)**
Need to **include more multimedia resources**	**(usability)**
User gets **tired** more easily	**(usability)**
More **familiarisation with the format** required	**(usability)**
More **time consuming**	**(usability)**
Expectation **gap**	**(navigation)**
Format **distracts**	**(usability)**

Interestingly, one comment was about the *bad effects* (sic) of immediate feedback on learning. It goes like *if there is immediate feedback then efforts to think are limited*. However, Norman (1988) posits that "feedback — sending back to the user information about what action has actually been done, what result has been

accomplished — is a well known concept in the science of control and information theory" (p.27). Perhaps the subject who made this comment has misinterpreted the feedback given in the application. In fact, it indicated when there was a mismatch but did not give the user the right answer. The user had to search the answers in the 'reading-to-learn tasks' along the application. In relation to this kind of comment, Norman (1988) argues that together with each technological advance, that provides a mental aid, there comes also the critics "who decry the loss of the human skill that has been made less valuable" (p.193). The discussion about the pedagogical efficacy of the use of calculators at school, for example, is still a controversial issue in some educational circles.

Isn't it good "to have continual feedback" — consult and be given a straightforward answer in relation to a task "plus useful advice" — so that we can reconsider (in case of mistake) and read again, think again, and try again? It seems to me that such a comment is a trivial one. Perhaps this could be illustrative of the transition most learners are going through from the old paradigm of education when the student had to make his/her results worthwhile by struggling and suffering in order to find out the right answer; when they had to count on the teacher's expertise in order to give them the 'right' answer; when teachers were viewed as the only source of knowledge. The new paradigm, on the other hand, has repositioned learners expecting them to take most part of the control of their learning experiences.

Conversely, as hypertext provides for an unstructured learning environment, it is more suitable to rely on the learner's strategies, on his/her metacognitive

knowledge. Therefore, more talented learners might profit more effectively from it by attempting to maximise results and minimise efforts. Hypertext also provides the user with more autonomy to decide what to do, where to go, how much to see, leaving more time to think about things that matter, with gains in enjoyment and control, as Norman asserts.

Another negative point referred to by a subject was the potential for distraction hypertext had. Indeed, this corroborates Pilkington and Parker-Jones' (1996) formative evaluation study in which medical students interact with a simulation model of calcium balance. In accordance with the authors, one of the difficulties of dealing with simulations (here I include my hypertextual application) is that "there can be a tendency for students to concentrate on the manipulation of objects, without generating a deeper understanding of the model, or principles which lie behind observed behaviour" (p.1).

Nevertheless, the negative points should perhaps be interpreted much more as a contribution to the improvement of the format rather than as a sign of rejection of it.

5.1.2.2 Interaction

My own observation of the whole experiment led me to perceive the huge amount of interaction created by the subjects either with the application itself or with the researcher (See Appendix K). The reason for that may partly reside on the interactional style adopted in the experiment, namely the single condition type, where each subject interacted individually with the researcher / the interface. Other

explanations for the great amount of researcher/subject interactions may be the following:

- the dialogical nature of people;
- the mediational rhetorical role of the application;
- the level of engagement of the subjects;
- the traditional pedagogy deeply rooted in the subjects' mental framework that does not privilege the enhancement of the student's self reliance.

One of the criteria used to consider interaction was the number of moves taken by the subjects along the application. Those with less than 5% of moves were considered as demonstrating a low level of interaction (3 subjects); those showing between 5% and 10% of moves (5 subjects) were considered as having an intermediate level of interaction. Finally, those with more than that were considered as having a high level of interaction (4 subjects). Table 14 shows the results in relation to the rated moves:

Table 14. Results related to the overall moves

Subjects	A	B	C	D	E	F	G	H	I	J	K	L	**Total**
Nr of moves	84	269	91	133	183	69	51	51	220	212	106	98	1567
%	5.3	17.1	5.8	8.4	11.6	4.4	3.2	3.2	14.0	13.5	6.7	6.2	

The subjects rating between 5% and 10% of all moves were in an intermediate interaction rating position (subjects A, C, D, K, and L). Those rating above that were considered of showing a high interaction rating position (subject B, E, I, and J).

A brief analysis of the quality of the dialogues taken place along the experiment between subjects and researcher, and/or subject and interface pinpoints differences resulting from the way subjects perceived the situation, and differences in relation to their learning styles. Thus, in the single condition interaction style (researcher and individual subject) used in the current investigation, some subjects may have perceived it as a somewhat asymmetrical, i.e. authority versus non-authority, situation. Therefore, they tended to position themselves as novices searching for an expert's advice, and viewing the researcher as a reliable source of information and help. This sort of code worked better with the non-knowledgeable subjects, who lacked familiarity with interface concepts or task concepts (format/content). The researcher had to give more prompts and hints to them than to the knowledgeable/expert ones.

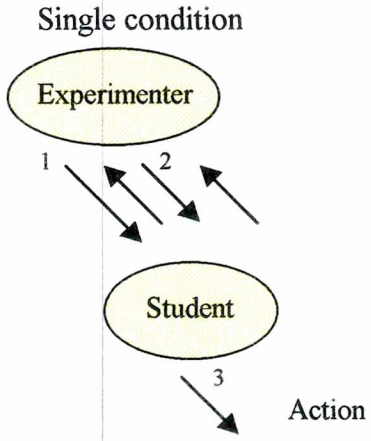
However, the 'ping-pong' negotiation of meaning that is present in most dialogues between subjects and researcher reveals the researcher's attempts to avoid such an assymetrical context. Rather, the intention was to create an environment where the researcher could be viewed more of an able peer who serves as guide or couch helping the subject to find his/her own paths rather than an authoritative ultimate source.

On the other hand, the same single condition interaction style seemed not to have affected the dialogical predisposition of some other subjects, who might have perceived the situation under a more self-regulatory vantage point, or the tasks/environment as not cognitively demanding enough. They belonged to either the knowledgeable group or to the expert group.

Of course the incidence of moves *per si* is not a conclusive indication of the level of interaction. Indeed, a subject could have a high incidence of moves not because he/she was extensively and intensively interacting profitably with the application but because he/she was disoriented and, therefore, looking for a way out. However, discarding other variables, such as overloading and disorientation, the incidence of moves might be pointed out as a reasonable criterion to judge the level of interactivity supported by the application in the experiment.

A representation of the interaction pattern used along the present experiment is shown in Figure 14. It draws on Pilkington and Parker-Jones' (1996, p.11) when studying the benefits of interacting either with tutor or peer.

Figure 14. Exchange pattern most frequently used in the experiment



At step 1 the researcher asks a question or gives a prompt. Step 2 represents the student answering (giving reasons, explanations, intentions, defenses), giving statements or counter statements, accepting or rejecting before deciding to act. Step 3 represents a decision taken to act in some way.

These results are far from making strong conclusions. In fact, as Leu and Reinking (1996) admit, there is the necessity of a more systematic focus on interest and other motivational factors in electronic learning environments in order to enhance cognitive theories of learning in such contexts. On the other hand, Pilkington and Parker-Jones (1996) acknowledge that in evaluating learning environments and the aspects that could bring learning gains, dialogue has been a neglected area. Therefore, more studies on the topic should be crucial.

Taking these remarks into account this study could not avoid registering some comments about dialogical aspects, interest and other motivational factors in relation to the subjects verbalisations. The subjects' reactions and observations made along the think-aloud protocol have provided me with a collection of qualitative clues about affective issues that I considered noteworthy. Some are commented here:

- Although no subject has got to traverse the application to its full extension, it was easy to perceive that some of them worked exhaustively in order to accomplish as much as they could while others limited themselves to explore just what they must have considered as essential for the experiment sake. For the former cases the explanation might rest on full engagement, for the latter, probably 'selective interest' in content and/or format. Engagement might be perceived by comments involving evaluation of target object, evaluation of the system content (like/dislike, enjoy/not enjoy), or of his/her performance in relation to the application. This kind of evaluation accounted for 15% of all occurrences. Some examples are:

➢ self-evaluation — possibly the format gave some students the opportunity to reflect on their cognitive styles, as in the following example:

Subject B:

Eg. *Ah, eu sou chata, não desisto.*

- evaluation of task object, either with a challenge resonance, as in the following comment:

Subject B:

Eg. *Ah, esse aqui é difícil* (NB: the subject did not give up on the task).

or implicitly demonstrating intention to avoid the task, as in the example below:

Subject L:

Eg. *É muito chato.*

Subject J:

Eg. *É super legal, gostei desse aqui.*

- evaluation of the navigation system

Subject B:

Eg. *Sabe o que devia fazer? Devia ficar vermelhinho o que a gente já entrou. Prá lembrar.*

Subject I:

Eg. *Isso aqui é sacanagem. É sacanagem!*

Subject J:

Eg. *Gostei dos exemplos.*

Subject I:

Eg. *Acho que esse não é tão fun.*

- Evaluation of the exploration carried out

Subject B:

Eg. *Ah, agora eu piorei, só faltavam duas, agora faltam três.*

- Evaluation of one's own navigation method

Subject I:

Eg. *...tudo isso prá fazer o exercício lá no conhecimento prévio*

Sou muito sequencial. Deu prá notar, né?

Subject F:

Eg. ...Daí o que tem prá fazer são os exercícios que daí eu vi todos eles mas não fiz nenhum porque primeiro eu peguei uma idéia geral do que... tudo o que tava sendo colocado...

- Subjects also attempted connecting the tasks with real life experiences:

Subject L:

Eg. *Isso eu uso bastante quando eu leio...*

Eg. É mais ou menos dentro do que eu aprendi, né...

Subject J:

Eg. *Ah, igual o que a professora passou prá nós...*

- Some slight discomfort with the medium/application could be noticed:

Subject I:

Eg. *Tô ficando nervosa (...). Não, é nervosa não é por causa do teste, é por causa do tamanho da letra e a quantidade de coisa escrita.*

Subject L:

Eg. *Ficou ruim porque a barra ficou muito...e aí você tem que subir e descer, né...*

Perhaps further investigation on the effects of interactional styles in EFL electronic environments could bring interesting and insightful findings as far as learning gains are concerned.

5.1.2.3 Subjects' learning style

Some of the results of the present experiment appear to be consistent with the literature in respect to a possible association between the different subjects' perceptions and their learning styles.

It was found, as expected, some remarkable individual differences in relation to the subjects' learning styles. Thus, in the present experiment three main 'mental models' / learning styles have been put forward to categorise the cognitive and metacognitive aspects observed among the subjects: a) initiative type, b) compliance type, and c) selective type. The initiative user worships the possibilities provided by the machine, maximises the attempts to execute commands that could enhance his/her control over the machine/application even in detriment of task performance. Included here are those who attempted the use of commands that could minimise efforts, and those who experienced the 'execution gulf' (subjects D, K, G, L). Norman (1988) refers to these gulfs as the distance between the mental representations of the person (what we want to do) and the physical components and states of the environment (what can be done) (see section 4.2.2). Kintsch (1998) uses the expressions 'want-to' referring to 'potential actions' and 'can-do' referring to 'possible actions' nodes. They seem to be in analogy with Norman's gulfs.

The frustration of unsuccessfully attempting to increase control over the application by, for example, trying to add functions to whom the system had not been prepared has been reported by at least two subjects in the questionnaire (question 13).

It is noteworthy to say that the categorisation I have put forward does not intend to be a rigid one. It has been devised just to characterise the trends noticed in this specific experiment.

- **Subjetcs' choice of strategies profile and learning style**

In relation to the learning style dichotomies established previously, the subjects of the initiative type could roughly speaking be also categorised as *intuition type* (following Shneiderman's on Jung categorisation. See section 2.7), *field-independent* (Leu, 2000), or Honey and Mumford's (1986, as cited in Shaw & Marlow, 1999) *activist*. Subject L is an example of those different taxonomies.

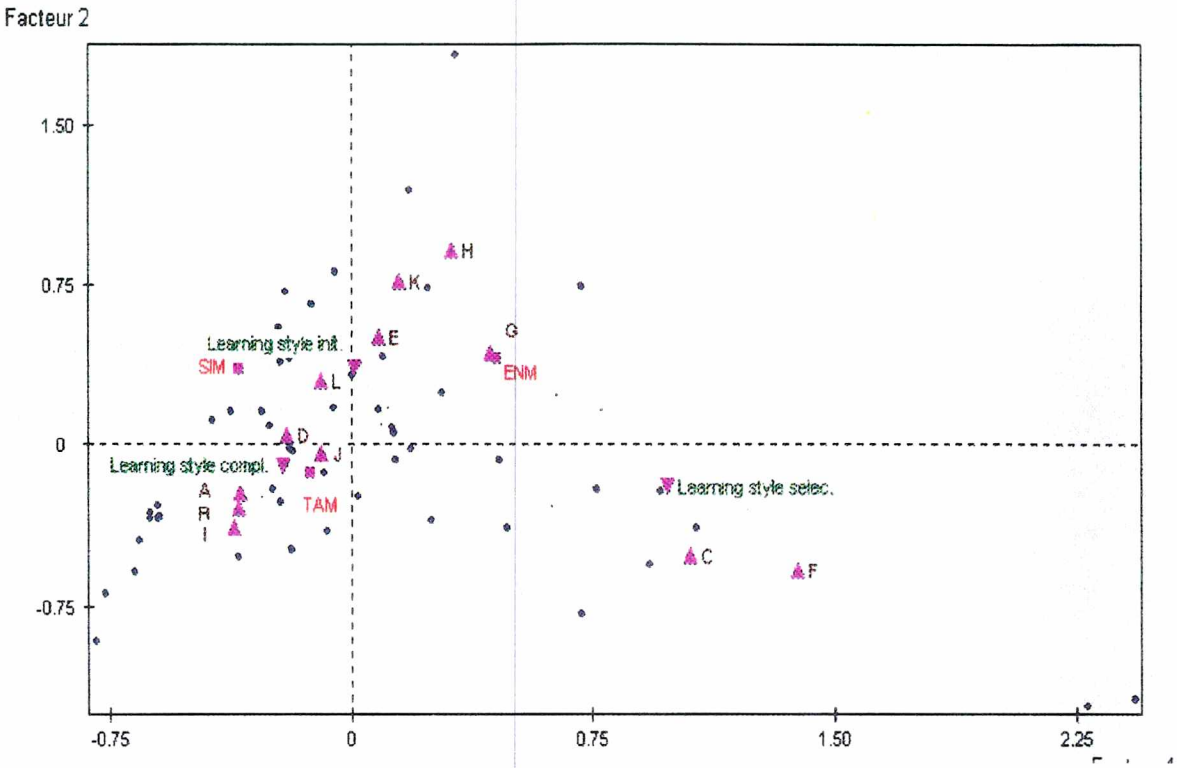
The *compliance category,* on the other hand, includes those users who thoroughly followed the tasks and maintained an intense dialogical basis with the researcher aiming at getting suggestions, tips, advice, feedback, and encouragement (the researcher was almost a full participant of the experiment.. They only rarely attempted to violate the rules either because they knew they had to conform to a context (not very familiar) /situation (experiment, non real), or because they did not know how to do it. They might be included in the *extroversion / sensing type* dichotomy of Shneiderman (1998b) based on Jung's (see section 2.7), and *field-dependent*. Subject A, B, E, J, and I are included in this category. In relation to the

learning style categorisations put forward by Honey and Mumford (1986, as cited in Shaw & Marlow, 1999) (see section 2.7), subjects B and J could possibly be also classified as Convergers / Reflectors, and subject I as Assimilator/Activist.

Finally, the *selective type* comprising those who just explored the application but got minimally involved with it. Perhaps the familiarity with both format and content has triggered a sub-conscious valence analysis of the effort necessary to accomplish the task versus the value they gave to the outcomes. It might be that users in this category did not see the situation as really purposeful and were there just for some kind of collaboration. Graph 9 shows a comparison of the choice of strategies profile of the subjects who presented different learning styles.

Seen from a cognitive perspective, total (or almost) exploratory behaviour might denote overlapping. Thus, subjects C and F have been allocated in the *Selective* category. If other categorisations discussed here were to be taken into account, these subjects could be placed in the *introvert, thinking, field-independent* categories where knowledge is hierarchically organised.

Graph 9. Subjects' strategies profile and learning style

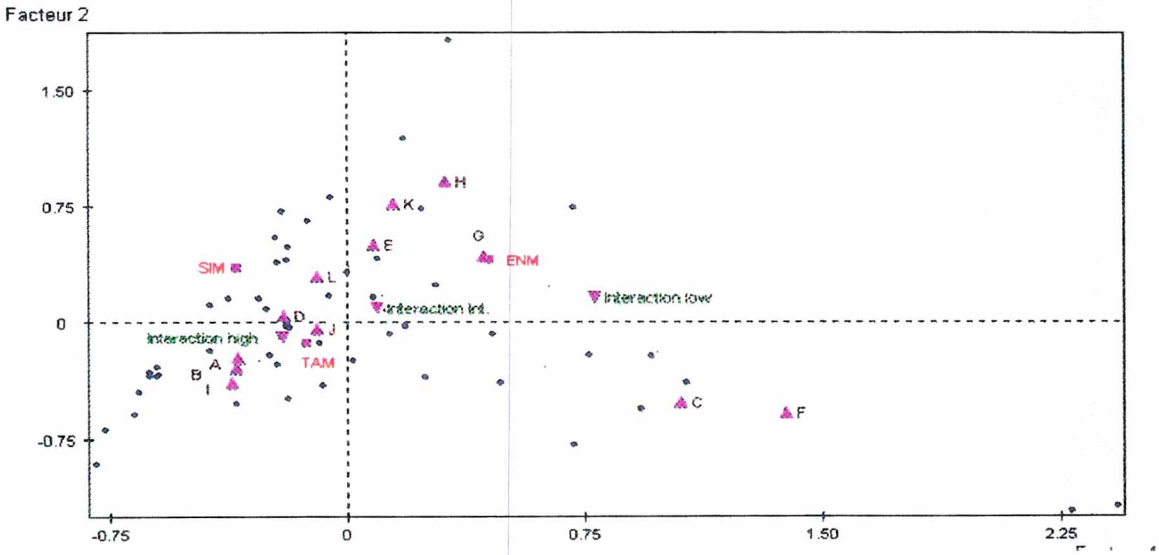


➢ **Subjects' choice of strategies profile and Interaction**

The Cluster Analysis undertaken also permitted one to check the existence or not of associations between the choice of strategies profile and the subjects' individual differences, namely the level of interaction occurred between subject and application, self, or researcher. The criterion to measure the subject's level of interaction was the number of moves (and concomitant comments) taken by the subjects along the application experiment. Thus, subjects have been considered as having a *low* interaction if he/she presented less than 5% of the total of moves;

intermediate (between 5% and 9% of the total of moves), and *high* level of interaction (10% and above). Graph 10 allows some comparisons related to the choice of strategies profile of the subjects who presented different levels of interaction.

Graph 10. Subjects' profile according to their level of interaction



There were two sessions when the subjects (subjects F and H) were almost complete explorers only, with very low rates of interaction, the researcher playing the full role of a complete observer.

Differently from the general stages pattern noticed in most subjects' moves along the hypertetxtual application, i.e. high incidence of exploratory moves in the very beginning of the application, later intermingled with a high occurrence of action

moves, subject F, for instance, acknowledged having only explored the whole application:

Subject F:

Eg. *Daí, o que tem prá fazer são exercícios que daí eu vi todos eles, mas não fiz nenhum porque primeiro eu peguei uma idéia geral do que...tudo o que tava sendo colocado...*

Subjects G (51 moves = 3,25%), H (51 moves = 3,25%) and F (69 moves = 4,4%) had the lowest number of moves. Altogether, the three represented only 10,9% of all the moves of the experiment. Subject C did not have an intense level of interaction either. However, her results allowed for a lower-intermediate categorisation, with 5,8% of moves (91 moves). In contrast, subject B alone registered the highest incidence (11,01%) of moves (see Appendix F).

If the Class categorisations are considered here, as discussed earlier, it could be said that Class 2 is more associated with the choice of strategies profile of the subjects with a high level of interaction, whereas Class 1 is more associated with subjects with a low level of interaction and in a smaller proportion with an intermediate level of interaction. These can be visualised in Graph 5.

As for 'problem report' occurrence, subjects F, G, H and K also had the lowest 'problem report' rate. Subject F, for example, has reported just one problem, and it was related to content:

Subject F:

Eg....*Bom...não...não entendi muito bem o texto.*

In addition, he used the 'read documentation' strategy only once. This seems to confirm Bodner and collaborators' (2001) postulate that interactivity represents an important indicator of the user's navigational style. Such a postulate could be expanded to represent an indicator of the user's learning style itself as categorised above. It was observed that the novice/non-knowledgeable subjects made more queries and presented more relevance judgements, while the knowledgeable/experts tended to present fewer queries and relevance judgements. Subjects B and F's contrasting behaviours illustrate the different styles to approach a hypertextual application. They also confirm the importance of the interaction between interface knowledge, task domain knowledge and background knowledge. Gaillies, Denhière and Jhean-Larose (1999) argue that "advanced, intermediate and beginner subjects differ not only in the quantity of previous knowledge they possess, but also in the organisation of that knowledge" (p.152). As far as background knowledge is concerned, 41,6% of the subjects pointed out in the questionnaire the lack of background knowledge as a cause for their difficulties with resolving tasks.

All in all, the way subjects approached the application corroborate the literature on the importance of active roles for learning, previous knowledge, learning styles, and helped confirm my expectations about the interaction man-machine as a source of motivation enhancement in hypertextual applications for instructional purposes. The analysis of the data provided by the experiment also evidenced that feedback effectiveness depends on learning style, working well for some people and not very satisfactorily for others; that linearity did not prevail, subjects having varied the order the nodes have been approached; that subjects have varied the order of paths along the application. And yet, even with such a variation

no subject has accomplished to traverse all the application screens. The impression one has is that there were twelve different applications, each being constructed according to the user-in-charge's indiosynchrasies.

5. 2 Cognitive overload

The second issue posed in this investigation was related to the possible cognitive overload caused by the hypertextual structure. Cognitive overload, also referred to as cognitive overhead, is defined by Rouet and Tricot (1996) as "an excessive burden on subjects' processes of reading and navigating the hypertext" (p.244). When studying differences between experts and novices in relation to simulation of errors in an electronic context, Kintsch (1998) acknowledged that overloading may be a problem to both, though experts could deal more easily with it if compared with novices or intermediates.

In the current study the subjects did not report any special difficulty in relation to navigation as the application structure was quite simple. The problem reports related to the subjects' navigating the application were much more of the rhetorical or dialogical type:

Subject L:

Eg. E agora? Não sei o que fazer...

Indeed, only 8.3% of the subjects acknowledged navigation (questionnaire, question 1) as 'inadequate' or 'complex'. On the other hand, 41.6% of the subjects

reported difficulties with task content and attributed such difficulties to lack of previous knowledge (Questionnaire, question 12).

On the face of the results, it may be said that a major outcome from the present experiment was that apparently the subjects did not experience any special difficulty in coping with the interface system. In fact, it seems that they had to deal mainly with linguistic problems though some minor structural problems have been reported.

In fact, lack of linguistic expertise is a real problem in this context, mainly if we consider the several other factors one has to deal with when reading. Brand-Gruwel, Aarnoutse and Van den Bos (1998) comment on how complex reading comprehension is and the several aspects it involves, like making inferences, integrating information from various knowledge sources, controlling and monitoring reading behaviour, and checking whether one really understands what is being read. Still, some fix-up decisions have to be taken in case problems are detected.

Apart from doing all the aforementioned mental activities, most of the subjects had also to be able to command and control a less familiar and much more dynamic and demanding electronic context — the hypertext structure. The adding up of all those aspects may truly cause a mental burden on readers. That is why one subject considered the working with hypertext 'tiring' and 'slower' (Questionnaire – negative points) than the traditional format. Such a view has its value if we realise that, differently from reading hardcopy, reading on the screen, mainly for learning purposes, is not an everyday activity for most people. Norman (1988) defines *not* everyday activities as "those ones with wide and deep structures, the ones that require considerable conscious planning and thought, deliberate trial and error:

trying first this approach, then that — backtracking" (p. 125). That seems to be what subject E does in the following example:

> *Deixa eu fazer, vê se eu acerto agora... Agora eu vou corrigir...tentar corrigir o que eu fiz de errado...* (Silêncio) *Três...tem que trocar as três..* (vai digitando e tentando). *Tá, corrigir de novo* (vai corrigir e ver o resultado de novo). Errei de novo (Ri). (Novo silêncio, tenta acertar). *A gente vê os erros e fica mais fácil. Agora que eu peguei o sentido do texto aqui. Ãhan...Agora eu vou corrigir de novo...vê se eu acertei...* (Acerta). *Agora deu.*

That is what most subjects did along the experiment: they were dealing with a new reading pattern (unstructured), a relatively new reading medium (computer), a relatively new content approach (ESP), and relatively new attitudes towards learning (agency and accountability). Surely this novel perspective requires time and mental effort till new patterns and matches are created. Conversely, 'speed' has also been pointed out by some subjects as a positive aspect of the hypertextual format. Perhaps they were referring to the possibilities of fast backtrack/forward movements, retrievals, and leaps the format proportioned.

Some elicitations along the think-aloud protocol might lead to be interpreted as hypertext disorientation, though related to the mild type posited by Conklin (1987, as cited in Heller, 1990). Disorientation is instantiated when the 'problem report' stage/strategy is discussed.

Of course, even being of a mild type, disorientation may contribute to a general feeling of overloading. In the experiment, if there was some overloading, it was probably due to three main deficits. The terminology used belongs to De Greef and Neerincx (1995, p.546):

- **lack of expertise** (as when the subject interacted with the researcher in an attempt to gather procedural or declarative knowledge, for instance, when the subject hypothesises on content meaning:

  Subject I:

  Eg. *Columbus!? O detetive?... Que é isso? Ao que ele se refere? Columbus...o único que eu conheço é o detetive da TV...*

- **difficulties in applying expertise** (as when the subject had some expertise in dealing with word processors, Internet, e-mail, for example, but he/she demonstrated a lack of fore-knowledge about parts of the task:

  Subject I:

  Eg. *Ah, isso aqui é prá corrigir?'* (referring to the command CORRIGIR).

  Eg. *Eu entendi o que aconteceu aqui, mas aqui eu ainda não entendi não.*

- **applying wrong expertise** (as when the subject misinterpreted the strategy that was supposed to be used to accomplish a task:

  Subject B:

  Eg. *Ah, é isso? Eu achei que se quisesse apagar, botar em outra opção, eu clicaria aqui prá corrigir. Se você quiser saber, né...*

  Subject E:

  Eg. *Acho que a primeira vez que eu tinha feito tava com a idéia errada.*

Thus, it is reasonable to conclude from the data that if the hypertextual format has violated some of the subjects' long standing reading assumptions, such violations were concerned with the decision-making tasks related to:

- the imposing of hierarchy

  Subject A:

  Eg. *Será que eu posso ver alguma coisa do fim? Posso?*

- relevance

  Subject A:

  Eg. *Tá, posso escolher o que eu quero? Esses links aqui?*

- Timing

  Subject B:

  Eg. *Você trouxe dez fitas, né, porque eu fico...*

In electronic reading environments, such tasks, traditionally performed by the writer, have been suddenly transferred to the reader, imposing more mental effort, and sometimes, more strain. As Charney (1994) advocates:

> Hypertext, by shifting a large portion of this burden to the reader, by proliferating the reader's choices about what portions of a text to read and in what order, compound the difficulties of creating a coherent mental representation (p.245).

Viewed from a more challenging perspective, though, they may help enhance self-regulation and empowerment.

A metaphorical angle from where to explain such a burden could be found in Bolter's (1991) comments on why visitors to traditional museums are fatigued in contrast to the average Epcot Centre visitors:

> Visitors to traditional museums are fatigued in part because they are doing work that is inherently fatiguing: they are reading and reflecting on the artefacts. Visitors to the Epcot Center are simply gliding through a simulated environment that encourages no reflective thinking (p. 231).

Chapter VI

CONCLUSIONS, LIMITATIONS AND PEDAGOGICAL IMPLICATIONS

6.1 Conclusions

The main research issue addressed here consisted of mapping reading strategies Brazilian EFL students used in an electronic learning environment. Two other related issues have also been considered: a) whether motivation was enhanced with the use of a hypertextual format; and b) whether the hypertext format caused some kind of overload for the users. A hypertextual instructional prototype was designed and its first version tested in a one-subject experiment. The strengths and weaknesses have been checked, both in terms of design and content. The pilot experiment also served the purpose of verifying the accomplishment feasibility of the main inquiry put forward in this study. Finally, a refined prototype version was developed and used for the purposes of this study.

For the main experiment, data was collected from 12 subjects. The fine-grained analysis of the corpus obtained provided the spotting of 71 stages/strategies, 42 more than those found out by Kauer and collaborators. Six predominant stages/strategies which accounted for at least 5% of the total of moves (1567) were identified and focused for statistical purposes. Two stages/strategies ('read documentation' and 'problem report') very much used by the subjects of the present study, have not been included in Kauer et al's work, probably due to the different nature of their environment and purpose of study.

The predominant stages/strategies revealed readers' trend to establish and maintain coherence in the electronic scenario by means of forming an intention, scanning and inspecting an area, reading documentation, evaluating, checking, and considering the target objects, i.e. the reading-to-learn tasks and the reading-to-do tasks. This corroborated in general terms the stages/strategies pointed out by other related studies.

The frequency rates indicate that the application provided grounds for 'doing things'. Indeed, being an instructional module it was expected that the 'read-to-learn' tasks (involving mental behaviour, like reasoning, in general terms), and the 'read-to-do tasks' (involving intention and execution of actions properly speaking) would be privileged. On the other hand, the also high rates of exploratory actions were in accordance with navigational patterns of interfaces physical behaviour (like backtracking, skipping screens, mouse-clicking on different links, etc.), and with patterns of human-centered activities. Therefore, it can be said that the application led the subjects to use both kinds of modes of actions (task actions and explore navigate) more than initiative modes of action to solve the read-to-learn and read-to-do tasks.

The statistical analysis of the stages/strategies spotted in the think-aloud protocol demonstred that both task actions and exploratory actions have similar frequency patterns, although task actions have registered a higher number of occurrences. This confirms the results of some studies that point out the exploratory nature of human beings, and the fertile terrain electronic environments provide for it. On the other hand, the higher frequency of task actions all the experiment long

demonstrates the importance of execution implicit in the reading-to-do tasks, as well as the intrinsic instrumental nature of the hypertextual platform.

The concrete, straightforward correlation established between the 'read documentation' stage/strategy and 'problem reports' foregrounded deficits in the construction and maintenance of coherence, in terms of interface and/or content. This notion was further supported by the apparent association with the subjects' mental model / learning style. For instance, the establishment and maintenance of coherence seemed to be the most outstanding demand of those subjects categorised in the *compliance group.*

As far as the second issue approached in this study, the body of qualitative evidence offered by the subjects' verbalisations gave support to the assumption put forward in this investigation that the hypertextual format did provide for fertile ground for engagement and search for autonomy. In general, the subjects attempted as much as possible to apply strategies they considered adequate in order to accomplish the goals established. This is in line with the requirements claimed by the literature as regards self-regulation and autonomy. This strong sign of engagement, no doubt, led to the conclusion that the subjects of the present study perceived an enhancement of motivation, in relation to the learning process, caused by the use of a hypertextual platform.

In addition, the results of the current investigation indicated that the hypertextual application provided for the augmentation of outcomes related to autonomy and self-regulation through the prevalent presence of the following features, all of them pointed out in the pertinent literature reviewed in this study:

- Connectivity — as when the subjects tried to make connections between the application content and their own academic lives; or when they tried to connect the topic focused with some other item previously explored in the application;
- Interaction — as when the subjects maintained an intense dialogical relationship with the application and /or the researcher;
- Decision making — as when the subjects decided, consciously or not, what to do first;
- Agency — as when the subjects felt they were in control, when they calculated cost-benefits, looked for shortcuts aiming at maximising output and minimising effort, and when they decided that enough was enough;
- Intertextuality — as when the subjects interpreted facts according to their own world views.

The different levels of engagement pointed to the confirmation of some studies about differences in learning styles that also depends on physical, intellectual and personality features (Shneiderman, 1998b) factors such as goals established, overlapping of the zones of learnability, task domain, familiarity with the interface, the navigational devices provided, how information has been organised, the credibility the experimental situation has raised, among others.

Regarding the third issue discussed in this study, i.e. whether hypertext created some kind of overload, the conclusion was that in general there was no significant overloading, with the subjects being able to perform tasks without too much strain. The conclusion was that if there was some overloading it was much more of the linguistic type; of course, some instances have also been registered of

difficulties in applying navigational expertise, or misinterpretation of navigational devices, but nothing important enough to jeopardise the subjects' performance.

This study investigated the strategies put forward by Brazilian EFL students in an electronic environment and for instructional purposes. The results indicate that the subjects used a great amount of strategies related to exploring, searching and doing things. The subjects may have been influenced by their cognitive style, personality traits, level of engagement (motivation), expertise, the way the application content was organised, the goals it prevailed, and the system itself. All these factors, used by the subjects in greater or lesser extent and in different combinations demonstrate that procedural knowledge varies. Therefore, it is important to consider the possibility of individualising as much as possible the electronic instructional work.

6.2 Limitations of the study

The current study presented some limitations which must be taken into account whenever any implications are drawn:

- Instrumentation constraints: Although a highly sophisticated application would not apply in the context of the current investigation, the hypertextual application did not completely satisfy the researcher as the interactive man-machine device only allowed basic interactional relationships. In spite of having been effective for the purposes of the present investigation, there is always the doubt whether a richer hypertext structure, where users could annotate their readings, keep a record of their paths, cut and paste elements from the database into their own

multimedia reports would provide for more and better data. Obviously, there would be consequences: intuitively one might think of an increase in the interaction man-machine, with both being able to react to a wider array of unforeseen situations. Theoretically there are some controversy on the topic, though. For instance, Lim (2001) argues that there may not be necessarily a correlation between a sophisticated platform and the level of interactivity in the learning environment" (133). In addition, it is likely that the level of cognitive burden would be higher, with users having to remember more interface artefacts, such as icons, symbols, widgets. Further research in an EFL scenario might provide opportunity to search for an answer for such a doubt.

- Spacial constraints: although a room has been allocated for the data collection, it did not offer the conditions of privacy that the experiment would suppose. On several opportunities people popped in the room, what may have distracted the subjects.
- Time constraints: some of the subjects had a very tight working schedule. This might have had an impact on their choices and procedures.

6.3 Some pedagogical implications

There is no sense in denying that the 'electronic way of being' is here and has come to stay. It is the opinion of most authors concerned with the query that hypertext creates new perspectives, with crucial implications, mainly to the way one approaches reading and writing. Hypertext is probably introducing a new way of thinking and processing information, and a new way of viewing study skills.

It is widely known that the medium defines the way one approaches text. In other words, the presentation format may encourage different text approaches, for instance, with emphasis on diverse learning styles. Therefore, in times of electronic literacy it is important that a thorough mapping of reading strategies be available in order to help materials designers, policy makers, and educators to trace more effective actions that could enhance teaching and learning. Computer activities hypertextually formatted could familiarise learners with new relational possibilities helping them enlarge their queries and perspectives. On the other hand, by sharing the teaching/learning responsibility with students, teachers could become more available. And availability could bring closeness. Teachers probably would have more time to individually, or semi-individually, attend and guide their pupils.

However, the question transcends reading skills. It has to do with educational policies. In fact, what our country needs in order to face the challenges of the electronic environment is to make students prepared to it. And this can only be accomplished if teachers are prepared to it too. As paradoxical as it might be, teachers are a key element in instructional hypermedia environments as we have commented along this study. That is why policies should be devised aiming at providing teachers with opportunities to discuss and understand the demands of the new eduactional paradigm of the electronic era. Also, educational policies should create opportunities for teachers to acquire network literacy, to be trained in cooperative skills, as well as in some basic software design skills so that they could create, adapt, and hopefully innovate in the area. Teachers' participation in the decision processes related to changes in beliefs and procedures are of utmost importance in the new literacy paradigm.

Network literacy could lead teachers to create customised instructional materials to attend individual needs and learning syles. The availability on the market place of Brazilian made academic materials to be used in the electronic environment and committed with our national peculiarities is extremely limited. Most of them are still being piloted in universities and technical schools at the moment. Indeed, what we have noticed is a trend towards elaborating electronic books, i.e. computer-mediated materials with a linear structure. The prototype developed for the present study might be further elaborated in terms of learning styles, levels of expertise, experimental models, among other features and possibly help contribute to the improvement of the multimedia literacy paradigm that has been shaped mainly along this decade.

Finally, there are some correlated questions which inescapably arise when information technology and pedagogic perspectives are at stake and which deserve foregrounds. The impact of this new literacy paradigm on public educational policies, the role assigned to learners and teachers in this paradigm, authorship, social interaction, and ethical aspects. Some of these issues have already been the study target of various promising researchers abroad, but too few, as far as I know, domestically. They are, no doubt, issues that deserve further attention and investigation in our national scenario.

Coda

Although the main issue put forward here has been related to the mapping of reading strategies used by Brazilian EFL students in an electronic, instructional context, a provoking follow up question seems to demand some consideration at this point. Indeed, it might be that one could still be striving to consolidate a mental representation that answers how the strategies spotted in the current investigation differ / resemble those of hardcopy reading research.

To answer this question, one should retrieve the results related to the most predominant strategies found in the present research: considering (target objects texts and tasks), scanning and inspecting (working areas), reading documentation (statements, texts, and tasks), stating intentions to act, executing (actions), checking (results), reporting (problems), and evaluating (undertaken actions and behaviours). One might argue that most of these strategies are also used in hardcopy environments. That is true and nobody is questioning it anyway. Just to freely paraphrase Ong (1982) in one of his countless discussions about the electronic word, they reinforce some of the old strategies, but of course transform them. The linear processing is much more associated with abilities to the making up of inferences and relevance judgement, while non-linear text processing is interpreted as strategic and dynamically-switch-based. Thus, the constraints of each medium might be object of some consideration.

Hardcopy and hypertext deal with different conceptual dimensions, different entry points, different loading places, different expectations. All these features require different approaches on its turn. Let us consider a city car and a racing car,

for instance. We are not saying that a racing car cannot be used in a city tour, or that a city car would not run in a racing track. What is at stake here is the conceptual issue underlying electronic environments. Conceptual issues, as everything else, are influenced by an array of features whose relevance varies according to what is being focused. Thus, it is also crucial to know in what circunstances and occasions each car could be used to be of utmost effectivity. Social relations and goals are pertinent aspects then.

Now, back again to the query about resemblances/differences in relation to the strategies spotted in the present investigation and traditional reading research, the answer could be in the focus. In fact, it has never been an usual preoccupation of hardcopy reading research to emphasise the importance, for instance, of issues such as simulations, where readers could manipulate objects (texts), colate, add, skip, retrieve, connect, negotiate with the text/application/interface, and get immediate reactions back. In other words, to view the texts as belonging to multidimensions. The multidimensional metaphor aims at demonstrating that different environments require different strategies and gives support to a variety of different responses on the part of the reader/user. In fact, reading is still *a mental, or cognitive process* as put by Davies (1995, p.1) but it involves more than a reader *trying to follow and respond to a message from a writer.* It may involve two, or ten thousand readers-writers contributing simultaneously to the construction of a text. The fact that *the writer is distant in space and time* does not matter any more because in the digital dimension space and time are minor issues. The process of *reading and responding to a writer* has long lost its *private and non-observable* character, as technology of information tends to transform what is private (isolated and quiet spaces, and words

possession) into public, what is non-observable into invasive. Finally, the way one reacts to immediate feedback is naturally different from the way one reacts to delayed feedback.

The possibility of constructing (in all senses) texts while reading has never been a central issue in traditional instructional material design, for example. It has been even beyond all its practicalities. Therefore, strategies like exploration, scanning, checking, etc. have a connotation different from that in an electronic environment.

Even intuitively it is expected that in (mainly) non-familiar, self-paced, reader-controlled situations like the ones occurring in hypertext, self-monitoring impose a lot of strain, a greater demand for reasoning time be required, and more evaluative comments be elicited. But this is the price for the reader's accountability and critical thinking be increased and ultimately citizenship be constructed.

Have my subjects demonstrated all that? The analysis of the corpus supplied by my subjects gives me grounds to affirm that the hypertextual format did afford for a great amount of self-exploration learning, reasoning and decision making. On the other hand, the subjects themselves have reported perceptions of motivation and control enhancement. Still, the findings of this study lead me to think that the format provided for a great deal of interaction and negotiation between reader-researcher, reader-text, reader system, reader-self. It was also observed that even novice users, those non-knowledgeable in the format, gave signs of accountability, self-confidence and persistence. Finally, there were innumerable demonstrations that hypertext is a promising format to generate active readers rather than passive reaceivers, as in

most traditional instructional printing. This greater sense of agency is what all literate environments dream of providing their students with.

The task has not finished though. In fact it is starting now. To have a more encompassing view of how traditional reading strategies and hypertextual strategies resemble/differ perhaps further investigation should be undertaken considering Brazilian EFL readers acting in both environments. Thus, one could compare types of strategies, variation in use, intensity, frequency and how learning styles and other variables would interfere. This certainly would help application designers, teachers, and policy makers to make more informed decisions.

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APPENDIX A
The hardcopy pre-test

Curso_____Fase_____ Sexo_____ Idade_____

Este teste faz parte de um experimento que será usado em minha tese de doutorado. Por favor, responda como se fosse uma situação real.

Obrigada por sua participação!

1. Leia o texto e responda o que se pede.

Adaptation

In "Microcosmic God," a 1941 science fiction story by Theodore Sturgeon, the main character creates a miniature world of beings who live and evolve extremely rapidly. He forces them to innovate by imposing various environmental threats on them. They react to storms, heat, drought— even a metal plunger moving inexorably down from their "sky" — with a steady stream of inventions and discoveries, from new insulating materials to power sources to super-hard aluminium. The crises in their environment act as catalysts for knowledge generation.

"Adapt or die" is their fate; so they adapt and advance.

The story provides a vivid metaphor for the way external (and sometimes internal) changes cause businesses to adapt. New products from competitors, new technologies, and social and economic changes drive knowledge generation because firms that don't change in response to changing conditions will fail. Success is often the enemy of innovation; it has been called the winner's curse. Lulled by past successs, companies sometimes fail to see that change is happening or to acknowledge that it can affect them. The appearence of low-cost, high-quality Japanese cars on the U.S. market changed the automotive world, but decades of dominance blinded American automakers to the magnitude of the threat. Similarly, Sears ignored the changes that Wal-Mart was making in the retailing environment until shrinking sales forced it to face reality.

A firm's ability to adapt is based on two principal factors: first, having existing internal resources and capabilities that can be utilized in new ways, and second, being open to change or having a high "absorptive capacity." The most important adaptive resources are employees who can acquire new knowledge and skills easily. Since the best predictor of mental nimbleness is proven experiences in taking on new tasks, firms should seek out employees who have already mastered a variety of roles and skills. After they've been hired, employees should also be encouraged to change jobs often, to build and manage their own skill portfolios, and to take "learning sabbaticals" to master new work-related disciplines.

(Tom Davenport & Lary Prusak. (Feb.1 1998). Working Knowledge:How Organizations Manage What They Know. In: *CIO Magazine*

a. Selecione uma sentença que, na sua opinião, melhor representa o assunto discutido no texto. Escreva-a nas linhas abaixo.

a. Selecione uma sentença que, na sua opinião, melhor representa o assunto discutido no texto. Escreva-a nas linhas abaixo.

_____

b. Quem é Theodore Sturgeon?

_____

c. De acordo com o texto, que características devem ter os funcionários para que a empresa sobreviva?

_____

_____

b. A que os autores se referem com a expressão ***winner's curse***? (2°. parág.)

_____

c. Que expressão do texto melhor resume a temática abordada?

_____

d. O texto revela uma causa e um efeito. Quais são eles?

_____

e. Na sua opinião, qual das situações abaixo melhor descreveria o que os autores chamam de **'learning sabbaticals'**?

- O funcionário pede demissão da empresa para tratar de assuntos acadêmicos;
- O funcionário pede demissão da empresa e abre seu próprio negócio;
- O funcionário sai da empresa para fazer cursos de especialização em sua área de trabalho;
- O funcionário sai da empresa para ensinar o que já sabe.

f. Você poderia citar alguma situação do cenário brasileiro ou internacional que exemplifique a sentença:

The crisis in their environment act as catalyst for knowledge generation (linhas 5-6)

- *A friend in need is a friend indeed*
- *Needs must when the devil drives*
- *Make a virtue of necessity*
- *Necessity is the mother of invention*

2. A que se referem as seguintes expressões:

who (linha 2) _____

them (linha 2) _____

it (linha 11)_____

them (linha 12)_____

3. Que sinônimos você indicaria para as palavras abaixo. Use o contexto onde a palavra se encontra para decidir:

- The crisis in their environment act as a ***catalyst*** for knowledge generation. (linha 5)

  a. mutation b. power c. qualification d. incentive

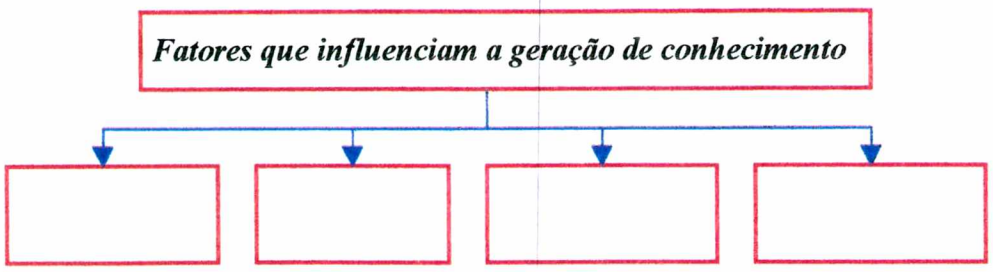
- ***Lulled*** by past success... (linha 11)

  a. agitated b. enhanced c. managed d. calmed

- Since the best predictor of mental ***nimbleness*** is proven experiences... (linha 19)

  a. activeness b. braveness c. magnitude d. gayness

4. Complete os quadros de acordo com informações obtidas no texto.



5. Com qual das formas abaixo você associaria o seguinte extrato do texto:

...from new insulating materials to power sources to super-hard aluminium. (linhas 4-5)

a. ↔, ↔, ↔. b. →•→•→• . c. —, —, —. d.

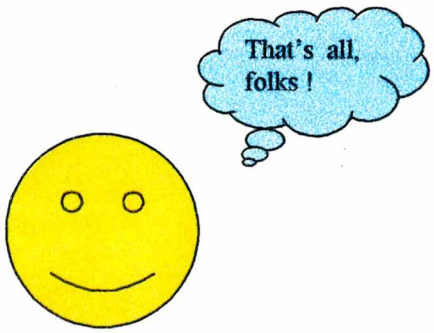
6. Algum motivo para "Microcosmic God" (linha 1) e "sky" (linha 4) aparecerem entre aspas?

a. NÃO.

b. Sim. "Microcosmic God" aparece entre aspas porque..._____

_____

"Sky" aparece entre aspas porque..._____



APPENDIX B
Structure of the hardcopy pre-test

questions	**purpose** Reading to...	**strategy stimulated**	**connections**
Question 1 Item a	synthesise	inferring the big idea analysing relevance	text-to-self
Item b	clarify	scanning	text-to-text
Item c	clarify & evaluate	skimming; scanning	text-to-text
Item d	interpret & evaluate	scanning	text-to-text
Item e	synthesising	skimming; evaluating	text-to-text & text-to-self
Item f	establish cause-effect	skimming, scanning, making use of rhetorical markers	text-to-text
Item g	interpret	scanning; analysing	text-to-self
Item h	apply knowledge to outside world	scanning; use of background knowledge	text-to-world
Item i	interpret	rephrasing	text-to-world
Question 2	interpret	establishing references	text-to-text
Question 3	decide on synonymy	using the context	text-to-self
Question 4	identify relevant information	scanning; note-taking	text-to-self
Question 5	establish associative reasoning	background knowledge	text-to-world
Question 6	evaluate importance of typographical devices	decision making	text-to-world

Text: Adaptation
Authors: Tom Davenport & Larry Prusak

APPENDIX C
The 'making of' of the application

1. Identification of the hypertextual unit

Title of the unit Basic reading strategies

Purpose: give the SS an introductory view of some basic reading strategies that could help enhance their reading
Format: hypertextual
Procedure while navigating: use of thinking-aloud protocol
Basic reading strategies: cognates, key words, background knowledge

2. 'Making of' of the program

- Elaboration of the story board of the unit : one four-hour session (researcher)
- Hiring of a programmer (Masters student: Dept. of Arts and Graphic Communication, UFSC)
- Programming: 13 hours (programmer individual work)
- Discussion session: 3 sessions of one hour each (programmer and researcher)
- Examination of the final product: one hour session (researcher and adviser)
- Correction: one hour-session to correct minor problems (programmer and researcher)

The Story Board (steps followed):

- Select basic strategies to work with
- Select, create/adapt tasks or questions
- Create nodes
- Provide a tree structure establishing links to specific items in the nodes
- Construct adequate feedback when appropriate (providing for variety/ preparing an inventory of all acceptable answers)

Feedback

Except for two judgement questions, feedback is provided for every response immediately after the completion of each task. Audio resources are used.

APPENDIX D
Instructions for the use of thr application

Instruções

Este teste faz parte de um experimento sobre leitura eletrônica que será usado em minha tese de doutorado. Leia as instruções cuidadosamente.

1. Você não precisa se identificar.
2. Você tem 10 minutos para responder este questionário.
3. Leia as perguntas com atenção.
4. Responda sinceramente.
5. Ao terminar, coloque a folha no envelope.

Obrigada por sua participação!

APPENDIX E
Post-test questionnaire

1. Você acha que o formato hipertextual que você usou mostrou-se

   a. muito adequado (instruções e exemplos suficientes), o que facilitou a navegação.
   b. adequado (mas poderia ter mais instruções e exemplos), o que facilitou a navegação.
   c. pouco adequado (instruções e exemplos insuficientes), o que dificultou a navegação.
   d. inadequado. A navegação tornou-se muito complicada.

2. Você gostaria de usar esse formato

   a. em todas as disciplinas do curso
   b. pelo menos em algumas disciplinas do curso
   c. só de vez em quando em todas as disciplinas
   d. só de vez em quando em algumas disciplinas
   e. em nenhuma disciplina

3. Como você se sentiu usando o formato hipertextual para fazer as tarefas solicitadas?

   a. relaxado(a) durante todo o experimento.
   b. tenso(a) durante todo o experimento
   c. indiferente durante todo o experimento
   d. um pouco tenso(a) no início, mas depois relaxei
   e. indiferente, mas depois me envolvi mais
   f. senti-me frustrado

4. Qual a sua impressão após terminar as tarefas no formato hipertextual...

   a. senti que posso monitorar melhor minha aprendizagem
   b. senti que tenho o controle das tarefas
   c. senti que fiquei mais limitado do que no formato tradicional
   d. senti que ficou mais difícil realizar as tarefas

e. senti que ficou mais fácil realizar as tarefas

5. Quanto ao seu rendimento, a impressão é de que

a. meu rendimento seria melhor no formato tradicional em papel
b. meu rendimento seria pior no formato tradicional em papel
c. meu rendimento seria bom, não importando o formato
d. meu rendimento seria ruim, não importando o formato

6. Qual o seu nível de satisfação ao utilizar o formato hipertextual...
a. muito alto b. alto c. médio d. regular e. baixo

7. Você consideraria que a unidade apresentada no formato hipertextual...

a. Estimulou você bastante para realizar as tarefas
b. estimulou você razoavelmente para realizar as tarefas
c. estimulou pouco
d. desestimulou

8. Você diria que a unidade no formato hipertextual possivelmente aumentou seu nível de envolvimento/atenção/concentração?

a. Sim b. Não c. Indiferente

9. ...e a razão é que...

a. como não tenho familiaridade com este formato para este tipo específico de tarefa em língua estrangeira, fiquei disperso
b. havia muita coisa para cuidar ao mesmo tempo
c. fato de a unidade ser provida de apelos de áudio e vídeo tornaram-na mais interessante e me mantiveram 'ligado(a)'
d. n.d.a.

10. Você achou que a resolução das tarefas neste formato hipertextual ficou...

a. mais lenta b. mais rápida c. igual

11. ...e a razão é que...

a. não estou familiarizado com este formato
b. não gosto desse formato, por isso precisei me esforçar mais e isso levou mais tempo
C. o formato ajuda a acelerar a resolução das tarefas
d. gosto do formato, mas acho que torna a resolução das tarefas mais lenta

12. A que você atribui as (possíveis) dificuldades na resolução das tarefas solicitadas?

a. ao formato
b. à minha dificuldade com o inglês
c. à ausência de conhecimento prévio do assunto tratado
d. a todos os itens acima
e. à combinação do item____ com o item ___

13. Que pontos positivos (de qualquer ordem) você poderia apontar ao usar esse formato?

_____

_____

14. Que pontos negativos (de qualquer ordem) você poderia apontar ao usar esse formato?

_____

_____

Obrigada!

APPENDIX F
Frequency Table
Stages/strategies identified in the think-aloud protocol

Strategies	Type	A	B	C	D	E	F	G	H	I	J	K	L	Total
1	ENM	0	0	0	0	1	0	0	0	0	0	0	0	1
2	ENM	0	1	0	0	0	0	0	0	0	0	0	0	1
3	ENM	1	1	0	1	0	0	0	1	3	0	1	2	10
4	ENM	0	0	0	0	0	0	0	0	0	1	0	0	1
5	ENM	0	1	1	1	3	2	0	0	1	0	0	0	9
6	ENM	0	1	0	0	0	0	0	0	0	0	0	0	1
7	ENM	0	2	0	1	3	3	1	0	2	2	1	0	15
8	ENM	2	2	1	6	2	1	0	0	2	0	3	3	22
9	ENM	0	0	0	1	0	0	0	0	0	0	0	0	1
10	ENM	0	1	0	0	0	0	0	0	3	0	0	2	6
11	ENM	0	0	0	2	0	0	0	0	0	0	0	0	2
12	ENM	0	4	1	0	2	0	0	0	2	3	1	2	15
13	ENM	0	5	1	2	3	1	0	0	3	3	7	2	27
14	ENM	0	0	1	0	0	0	0	0	0	0	0	0	1
15	ENM	0	1	0	1	0	0	0	0	0	0	0	0	2
16	ENM	0	0	1	0	0	0	0	0	0	0	0	0	1
17	ENM	0	5	0	1	0	0	0	0	1	0	0	1	8
18	ENM	0	1	0	0	0	0	0	0	0	0	0	0	1
19	ENM	0	0	2	0	0	0	0	0	0	0	0	0	2
20	ENM	3	3	1	4	8	0	1	1	12	5	3	2	43
21	ENM	6	16	12	10	36	0	9	11	7	25	22	11	165
22	ENM	0	1	12	0	0	11	1	0	0	0	0	0	25
23	SIM	0	0	0	1	0	1	1	1	0	0	1	1	6
24	SIM	1	6	0	4	1	0	0	0	1	2	1	2	18
25	TAM	0	0	0	0	0	0	0	0	0	0	1	0	1
26	TAM	0	2	0	0	0	0	0	0	0	0	0	0	2
27	TAM	2	0	0	1	4	0	0	2	1	1	2	3	16
28	TAM	1	3	0	3	4	2	0	0	0	0	0	0	13
29	TAM	0	0	0	2	0	5	0	0	4	6	1	2	20
30	TAM	0	0	0	0	0	0	1	0	2	0	0	0	3
31	TAM	0	1	2	3	1	0	0	0	2	0	2	1	12
32	TAM	0	6	1	7	0	3	2	0	8	10	0	0	37
33	TAM	0	0	1	1	0	0	0	0	0	0	0	0	2
34	TAM	0	1	0	0	0	0	0	0	0	0	0	0	1
35	TAM	4	18	1	13	9	0	2	5	15	13	8	9	97
36	TAM	0	0	0	1	1	0	0	0	0	0	0	0	2
37	TAM	3	2	2	2	7	0	1	1	0	2	1	2	23
38	TAM	0	0	0	0	0	0	1	0	0	0	0	1	2
39	TAM	5	4	1	2	3	2	0	0	7	1	0	0	25
40	TAM	0	2	0	6	9	4	4	9	3	15	13	6	71
41	TAM	2	5	0	1	2	0	0	0	0	3	0	2	15
42	TAM	0	1	1	1	3	1	1	0	4	1	1	2	16
43	TAM	0	9	1	2	2	4	2	0	10	1	3	4	38
44	TAM	2	9	3	4	5	1	0	0	4	4	2	2	36
45	TAM	0	3	0	0	0	0	0	0	0	0	0	1	4

46	TAM	0	0	0	0	0	0	0	0	1	0	0	0	1
47	TAM	0	0	0	2	0	0	0	0	0	1	1	0	4
48	TAM	1	4	1	0	3	0	0	0	2	0	1	1	13
49	TAM	0	0	0	0	1	0	0	0	0	0	0	0	1
50	TAM	6	29	15	11	27	11	12	15	14	16	17	9	182
51	TAM	0	0	0	0	0	5	0	0	0	6	1	1	13
52	TAM	0	5	0	0	0	0	0	0	0	0	0	0	5
53	TAM	0	0	0	0	0	0	0	0	1	0	1	1	3
54	TAM	1	3	1	1	0	2	0	0	2	2	2	0	14
55	TAM	8	18	7	1	14	5	7	5	10	13	0	2	90
56	TAM	2	4	0	1	6	0	0	0	1	5	4	0	23
57	TAM	0	0	0	0	3	0	0	0	3	0	1	0	7
58	TAM	0	0	0	0	0	0	0	0	2	0	0	0	2
59	TAM	0	0	0	0	0	0	0	0	0	0	0	1	1
60	TAM	1	1	1	0	0	1	0	0	0	1	0	0	5
61	TAM	0	5	0	0	0	0	0	0	0	1	0	0	6
62	TAM	2	0	0	0	0	0	0	0	1	0	0	1	4
63	TAM	4	16	3	9	7	2	1	0	14	12	1	8	77
64	TAM	3	5	0	1	0	0	0	0	1	1	1	0	12
65	TAM	0	2	0	0	0	0	2	0	0	0	0	0	4
66	TAM	0	1	0	0	0	0	0	0	0	0	0	0	1
67	TAM	18	34	13	14	4	1	1	0	55	37	0	3	180
68	TAM	0	3	0	0	0	0	0	0	0	0	0	0	3
69	TAM	0	1	3	0	1	1	1	0	0	1	0	2	10
70	TAM	6	20	1	9	8	0	0	0	16	18	2	6	86
71	TAM	0	1	0	0	0	0	0	0	0	0	0	0	1
Total		84	269	91	132	183	69	51	51	220	212	106	98	1567

APPENDIX G

Subjects' choice of strategies profile: Percentage of use of each strategy by individual participamnts

Strategie	Type	A	B	C	D	E	F	G	H	I	J	K	L	Total
1	ENM	0,00%	0,00%	0,00%	0,00%	0,55%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
2	ENM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
3	ENM	1,19%	0,37%	0,00%	0,76%	0,00%	0,00%	0,00%	1,96%	1,36%	0,00%	0,94%	2,04%	0,64%
4	ENM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,47%	0,00%	0,00%	0,06%
5	ENM	0,00%	0,37%	1,10%	0,76%	1,64%	2,90%	0,00%	0,00%	0,45%	0,00%	0,00%	0,00%	0,57%
6	ENM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
7	ENM	0,00%	0,74%	0,00%	0,76%	1,64%	4,35%	1,96%	0,00%	0,91%	0,94%	0,94%	0,00%	0,96%
8	ENM	2,38%	0,74%	1,10%	4,55%	1,09%	1,45%	0,00%	0,00%	0,91%	0,00%	2,83%	3,06%	1,40%
9	ENM	0,00%	0,00%	0,00%	0,76%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
10	ENM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	1,36%	0,00%	0,00%	2,04%	0,38%
11	ENM	0,00%	0,00%	0,00%	1,52%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,13%
12	ENM	0,00%	1,49%	1,10%	0,00%	1,09%	0,00%	0,00%	0,00%	0,91%	1,42%	0,94%	2,04%	0,96%
13	ENM	0,00%	1,86%	1,10%	1,52%	1,64%	1,45%	0,00%	0,00%	1,36%	1,42%	6,60%	2,04%	1,72%
14	ENM	0,00%	0,00%	1,10%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
15	ENM	0,00%	0,37%	0,00%	0,76%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,13%
16	ENM	0,00%	0,00%	1,10%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
17	ENM	0,00%	1,86%	0,00%	0,76%	0,00%	0,00%	0,00%	0,00%	0,45%	0,00%	0,00%	1,02%	0,51%
18	ENM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
19	ENM	0,00%	0,00%	2,20%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,13%
20	ENM	3,57%	1,12%	1,10%	3,03%	4,37%	0,00%	1,96%	1,96%	5,45%	2,36%	2,83%	2,04%	2,75%
21	ENM	7,14%	5,95%	13,19%	7,58%	19,67%	0,00%	17,65%	21,57%	3,18%	11,79%	20,75%	11,22%	10,54%
22	ENM	0,00%	0,37%	13,19%	0,00%	0,00%	15,94%	1,96%	0,00%	0,00%	0,00%	0,00%	0,00%	1,60%
23	SIM	0,00%	0,00%	0,00%	0,76%	0,00%	1,45%	1,96%	1,96%	0,00%	0,00%	0,94%	1,02%	0,38%
24	SIM	1,19%	2,23%	0,00%	3,03%	0,55%	0,00%	0,00%	0,00%	0,45%	0,94%	0,94%	2,04%	1,15%
25	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,94%	0,00%	0,06%
26	TAM	0,00%	0,74%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,13%
27	TAM	2,38%	0,00%	0,00%	0,76%	2,19%	0,00%	0,00%	3,92%	0,45%	0,47%	1,89%	3,06%	1,02%
28	TAM	1,19%	1,12%	0,00%	2,27%	2,19%	2,90%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,83%
29	TAM	0,00%	0,00%	0,00%	1,52%	0,00%	7,25%	0,00%	0,00%	1,82%	2,83%	0,94%	2,04%	1,28%
30	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	1,96%	0,00%	0,91%	0,00%	0,00%	0,00%	0,19%
31	TAM	0,00%	0,37%	2,20%	2,27%	0,55%	0,00%	0,00%	0,00%	0,91%	0,00%	1,89%	1,02%	0,77%
32	TAM	0,00%	2,23%	1,10%	5,30%	0,00%	4,35%	3,92%	0,00%	3,64%	4,72%	0,00%	0,00%	2,36%
33	TAM	0,00%	0,00%	1,10%	0,76%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,13%
34	TAM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
35	TAM	4,76%	6,69%	1,10%	9,85%	4,92%	0,00%	3,92%	9,80%	6,82%	6,13%	7,55%	9,18%	6,19%
36	TAM	0,00%	0,00%	0,00%	0,76%	0,55%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,13%
37	TAM	3,57%	0,74%	2,20%	1,52%	3,83%	0,00%	1,96%	1,96%	0,00%	0,94%	0,94%	2,04%	1,47%
38	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	1,96%	0,00%	0,00%	0,00%	0,00%	1,02%	0,13%
39	TAM	5,95%	1,49%	1,10%	1,52%	1,64%	2,90%	0,00%	0,00%	3,18%	0,47%	0,00%	0,00%	1,60%
40	TAM	0,00%	0,74%	0,00%	4,55%	4,92%	5,80%	7,84%	17,65%	1,36%	7,08%	12,26%	6,12%	4,53%
41	TAM	2,38%	1,86%	0,00%	0,76%	1,09%	0,00%	0,00%	0,00%	0,00%	1,42%	0,00%	2,04%	0,96%
42	TAM	0,00%	0,37%	1,10%	0,76%	1,64%	1,45%	1,96%	0,00%	1,82%	0,47%	0,94%	2,04%	1,02%
43	TAM	0,00%	3,35%	1,10%	1,52%	1,09%	5,80%	3,92%	0,00%	4,55%	0,47%	2,83%	4,08%	2,43%
44	TAM	2,38%	3,35%	3,30%	3,03%	2,73%	1,45%	0,00%	0,00%	1,82%	1,89%	1,89%	2,04%	2,30%
45	TAM	0,00%	1,12%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	1,02%	0,26%

46	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,45%	0,00%	0,00%	0,00%	0,06%
47	TAM	0,00%	0,00%	0,00%	1,52%	0,00%	0,00%	0,00%	0,00%	0,00%	0,47%	0,94%	0,00%	0,26%
48	TAM	1,19%	1,49%	1,10%	0,00%	1,64%	0,00%	0,00%	0,00%	0,91%	0,00%	0,94%	1,02%	0,83%
49	TAM	0,00%	0,00%	0,00%	0,00%	0,55%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
50	TAM	7,14%	10,78%	16,48%	8,33%	14,75%	15,94%	23,53%	29,41%	6,36%	7,55%	16,04%	9,18%	11,62%
51	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	7,25%	0,00%	0,00%	0,00%	2,83%	0,94%	1,02%	0,83%
52	TAM	0,00%	1,86%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,32%
53	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,45%	0,00%	0,94%	1,02%	0,19%
54	TAM	1,19%	1,12%	1,10%	0,76%	0,00%	2,90%	0,00%	0,00%	0,91%	0,94%	1,89%	0,00%	0,89%
55	TAM	9,52%	6,69%	7,69%	0,76%	7,65%	7,25%	13,73%	9,80%	4,55%	6,13%	0,00%	2,04%	5,75%
56	TAM	2,38%	1,49%	0,00%	0,76%	3,28%	0,00%	0,00%	0,00%	0,45%	2,36%	3,77%	0,00%	1,47%
57	TAM	0,00%	0,00%	0,00%	0,00%	1,64%	0,00%	0,00%	0,00%	1,36%	0,00%	0,94%	0,00%	0,45%
58	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,91%	0,00%	0,00%	0,00%	0,13%
59	TAM	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	1,02%	0,06%
60	TAM	1,19%	0,37%	1,10%	0,00%	0,00%	1,45%	0,00%	0,00%	0,00%	0,47%	0,00%	0,00%	0,32%
61	TAM	0,00%	1,86%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,47%	0,00%	0,00%	0,38%
62	TAM	2,38%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,45%	0,00%	0,00%	1,02%	0,26%
63	TAM	4,76%	5,95%	3,30%	6,06%	3,83%	2,90%	1,96%	0,00%	6,36%	5,66%	0,94%	8,16%	4,85%
64	TAM	3,57%	1,86%	0,00%	0,76%	0,00%	0,00%	0,00%	0,00%	0,45%	0,47%	0,94%	0,00%	0,77%
65	TAM	0,00%	0,74%	0,00%	0,00%	0,00%	0,00%	3,92%	0,00%	0,00%	0,00%	0,00%	0,00%	0,26%
66	TAM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
67	TAM	21,43%	12,64%	14,29%	10,61%	2,19%	1,45%	1,96%	0,00%	25,00%	17,45%	0,00%	3,06%	11,49%
68	TAM	0,00%	1,12%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,19%
69	TAM	0,00%	0,37%	3,30%	0,00%	0,55%	1,45%	1,96%	0,00%	0,00%	0,47%	0,00%	2,04%	0,64%
70	TAM	7,14%	7,43%	1,10%	6,82%	4,37%	0,00%	0,00%	0,00%	7,27%	8,49%	1,89%	6,12%	5,49%
71	TAM	0,00%	0,37%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	0,06%
		100	100	100	100	100	100	100	100	100	100	100	100	100

APPENDIX H

Stages/strategies identified in the think-aloud protocol with acronyms and number of occurrences

Nr	AÇÃO	STAGE	ACRONYMS	SUBJECT												TOTAL
				A	B	C	D	E	F	G	H	I	J	K	L	
01	ENM	cck	CIA					1								1
02	ENM	cck	CNM		1											1
03	ENM	cck	CSRN	1	1		1				1	3		1	2	10
04	ENM	cck	CWWBOEA										1			1
05	ENM	ddc	DISACA		1	1	1	3	2			1				9
06	ENM	ddc	DNM		1											1
07	ENM	ddc	DSRN		2		1	3	3	1		2	2	1		15
08	ENM	evl	EVNM	2	2	1	6	2	1			2		3	3	22
09	ENM	itp	IECO				1									1
10	ENM	itp	INF		1							3			2	6
11	ENM	itp	INM				2									2
12	ENM	int	IOCADT		4	1		2				2	3	1	2	15
13	ENM	lct	LCPW		5	1	2	3	1			3	3	7	2	27
14	ENM	pln	PHN			1										1
15	ENM	prd	PWPNWBIV		1		1									2
16	ENM	prd	PWWBHPW			1										1
17	ENM	prd	PWWBOEA		5		1					1			1	8
18	ENM	scn	S&CATO		1											1
19	ENM	scn	S&CVA			2										2
20	ENM	scn	S&CVAOS	3	3	1	4	8		1	1	12	5	3	2	43
21	ENM	scn	S&IA	6	16	12	10	36		9	11	7	25	22	11	165
22	ENM	scn	SCA		1	12			11	1						25
23	SIM	int	ICA				1		1	1	1			1	1	6
24	SIM	pln	PHTCBS	1	6		4	1				1	2	1	2	18
25	TAM	cck	CAE											1		1
26	TAM	csd	CAS		2											2
27	TAM	cck	CATO	2			1	4			2	1	1	2	3	16
28	TAM	csd	CCE	1	3		3	4	2							13
29	TAM	csd	CCTO				2		5			4	6	1	2	20
30	TAM	cck	CEEWLD							1		2				3
31	TAM	csd	CLTO		1	2	3	1				2		2	1	12
32	TAM	csd	CNATO		6	1	7		3	2		8	10			37
33	TAM	cck	COS			1	1									2
34	TAM	cck	CTR		1											1
35	TAM	cck	CVA	4	18	1	13	9		2	5	15	13	8	9	97
36	TAM	ddc	DGA				1	1								2
37	TAM	ddc	DGT	3	2	2	2	7		1	1		2	1	2	23
38	TAM	evl	EAE							1					1	2
39	TAM	evl	EATO	5	4	1	2	3	2			7	1			25
40	TAM	exc	EC		2		6	9	4	4	9	3	15	13	6	71
41	TAM	evl	ECE	2	5		1	2					3		2	15
42	TAM	evl	ECT		1	1	1	3	1	1		4	1	1	2	16
43	TAM	evl	ECTO		9	1	2	2	4	2		10	1	3	4	38
44	TAM	evl	EECO	2	9	3	4	5	1			4	4	2	2	36
45	TAM	evl	EH		3										1	4
46	TAM	evl	EHCP									1				1
47	TAM	evl	ES				2						1	1		4
48	TAM	evl	ESPAE	1	4	1		3				2		1	1	13
49	TAM	itp	IAE					1								1
50	TAM	int	IAT	6	29	15	11	27	11	12	15	14	16	17	9	182
51	TAM	itp	IATO						5				6	1	1	13
52	TAM	itp	ICAA		5											5
53	TAM	itp	ICE									1		1	1	3
54	TAM	itp	ICTO	1	3	1	1		2			2	2	2		14
55	TAM	int	IEC	8	18	7	1	14	5	7	5	10	13		2	90
56	TAM	itp	IFAA	2	4		1	6				1	5	4		23
57	TAM	int	IRATO					3				3		1		7
58	TAM	jtf	JPR									2				2
59	TAM	lct	LP												1	1
60	TAM	prv	PEAWLD	1	1	1			1				1			5
61	TAM	pln	PFA		5								1			6

62	TAM	pln	PFT	2								1			1	4
63	TAM	pbr	PR	4	16	3	9	7	2	1		14	12	1	8	77
64	TAM	rcd	RCATO	3	5		1					1	1	1		12
65	TAM	rcd	RCIRAT		2					2						4
66	TAM	rcd	RCTO		1											1
67	TAM	rdc	RD	18	34	13	14	4	1	1		55	37		3	180
68	TAM	rcd	RH		3											3
69	TAM	sag	SG		1	3		1	1	1			1		2	10
70	TAM	shy	SH	6	20	1	9	8				16	18	2	6	86
71	TAM	thy	TH		1											1
				84	269	91	133	183	69	51	51	220	212	106	98	1567

APPENDIX I
Table of acronyms

Nº	SEVENTY-ONE STAGES IDENTIFIED	ACRONYMS
01	check attributes of environment	CAE
02	consider attributes of the system	CAS
03	check attributes of target object	CATO
04	consider content of environment	CCE
05	consider content of target object	CCTO
06	check the end of an event with a long duration	CEEWLD
07	check & inspect an area	CIA
08	consider location of target object	CLTO
09	consider attributes of target object	CNATO
10	check navigation method	CNM
11	check orientation of self	COS
12	check the sequence required for navigation	CSRN
13	check task requirement	CTR
14	check the view angle	CVA
15	check what will be the outcome of an exploratory action	CWWBOEA
16	decide to give up on an acation	DGA
17	decide to give up on a task	DGT
18	deduce the interaction sequence after carrying out an action	DISACA
19	deduce navigation method	DNM
20	deduce the sequence required for navigation	DSRN
21	evaluate attributes of environment	EAE
22	evaluate attributes of target object	EATO
23	execute command	EC
24	evaluate content of environment	ECE
25	evaluate completed task	ECT
26	evaluate content of target object	ECTO
27	evaluate exploration carried out	EECO
28	evaluate himself/herself	EH
29	evaluate her current position	EHCP
30	evaluate navigation method (his/hers or the application's)	EVNM
31	evaluate system	ES
32	evaluate the state prior to the action execution	ESPAE
33	interpret attributes of the environment	IAE
34	intention to approach target	IAT
35	interpret attributes of target object	IATO
36	intention to control action	ICA
37	interpret content after an approach	ICAA
38	interpret content of environment	ICE
39	interpret content of target object	ICTO
40	intention to execute command	IEC
41	interpret exploration carried out	IECO
42	interpret feedback after an approach	IFAA
43	interpret navigation feedback	INF
44	interpret navigation method	INM
45	intention to opportunistically carry out an action for a different task	IOCADT
46	intention to re-approach target object	IRATO
47	justify problem report	JPR
48	locate the current position in the world (his/her position or the target object)	LCPW
49	locate problem	LP
50	perceive the end of an event with a long duration	PEAWLD
51	plan for future action	PFA
52	plan for future tasks	PFT
53	plan how to navigate	PHN
54	plan how to take control back from the system	PHTCBS
55	problem report	PR
56	predict what a planned navigation will bring into view	PWPNWBIV
57	predict what will be (his/her)position in the world	PWWBHPW
58	predict what will be the outcome of an exploratory action	PWWBOEA
59	re-consider attributes of target object	RCATO
60	re-consider intention to re-approach target	RCIRAT
61	reconsider the content of target object	RCTO
62	read documentation	RD
63	reconsider hypothesis	RH
64	scan & check attributes of target object	S&CATO
65	scan & check the view angle	S&CVA

66	scan & check the view angle or orientation of self	S&CVAOS
67	scan & inspect an area	S&IA
68	scan & check an area	SCA
69	set a goal	SG
70	set hypothesis	SH
71	test hypothesis	TH

Nº	ACTION	CODE	COLOR
I	TASK ACTION MODEL	TAM	VERMELHO
II	EXPLORATION NAVIGATION MODEL	ENM	AZUL
III	SYSTEM INICIATIVE MODEL	SIM	VERDE

APPENDIX J

Predominant stages/strategies with number of occurrences for each group

Nr	AÇÃO	STAGE	ACRONYMS	SUBJECT														
				A	B	C	D	E	F	G	H	I	J	K	L		SUB-TOTAL	
01	ENM	cck	CIA					1								1		
02	ENM	cck	CNM		1											1		
03	ENM	cck	CSRN	1	1		1				1	3		1	2	10		
04	ENM	cck	CWWBOEA										1			1		
25	TAM	cck	CAE											1		1		
27	TAM	cck	CATO	2			1	4			2	1	1	2	3	16		
30	TAM	cck	CEEWLD							1		2				3		
33	TAM	cck	COS			1	1									2		
34	TAM	cck	CTR		1											1		
35	TAM	cck	CVA	4	18	1	13	9		2	5	15	13	8	9	97	133	#
26	TAM	csd	CAS		2											2		
28	TAM	csd	CCE	1	3		3	4	2							13		
29	TAM	csd	CCTO				2		5			4	6	1	2	20		
31	TAM	csd	CLTO		1	2	3	1				2		2	1	12		
32	TAM	csd	CNATO		6	1	7		3	2		8	10			37	84	#
08	ENM	evl	EVNM	2	2	1	6	2	1			2		3	3	22		
38	TAM	evl	EAE							1					1	2		
39	TAM	evl	EATO	5	4	1	2	3	2			7	1			25		
41	TAM	evl	ECE	2	5		1	2					3		2	15		
42	TAM	evl	ECT		1	1	1	3	1	1		4	1	1	2	16		
43	TAM	evl	ECTO		9	1	2	2	4	2		10	1	3	4	38		
44	TAM	evl	EECO	2	9	3	4	5	1			4	4	2	2	36		
45	TAM	evl	EH		3										1	4		
46	TAM	evl	EHCP									1				1		
47	TAM	evl	ES				2						1	1		4		
48	TAM	evl	ESPAE	1	4	1		3				2		1	1	13	176	#
12	ENM	int	IOCADT		4	1		2				2	3	1	2	15		
23	SIM	int	ICA				1		1	1	1			1	1	6		
50	TAM	int	IAT	6	29	15	11	27	11	12	15	14	16	17	9	182		
55	TAM	int	IEC	8	18	7	1	14	5	7	5	10	13		2	90		
57	TAM	int	IRATO					3				3		1		7	300	#
67	TAM	rdc	RD	18	34	13	14	4	1	1		55	37		3	180	180	#
18	ENM	scn	S&CATO		1											1		
19	ENM	scn	S&CVA			2										2		
20	ENM	scn	S&CVAOS	3	3	1	4	8		1	1	12	5	3	2	43		
21	ENM	scn	S&IA	6	16	12	10	36		9	11	7	25	22	11	165		
22	ENM	scn	SCA		1	12			11	1						25	236	#
				61	176	76	90	133	48	41	41	168	141	71	63	###		
40	TAM	exc	EC		2		6	9	4	4	9	3	15	13	6	71		
63	TAM	pbr	PR	4	16	3	9	7	2	1		14	12	1	8	77		
																148		

APPENDIX K
Transcription of subjects' think-aloud protocols

Subject A

Sujeito: Tô lendo...Tá, aqui eu posso escolher o que eu quero? Esses links aqui?
Researcher: É, você trabalha do jeito que você quiser
S: Ah, tá. Hum..(Inaudível)...Hum, tá meio lento.....(Ela clica fora do aplicativo e entra no Portal Terra)
R: (Interferindo) Ei, onde é que você andou? Você saiu do nosso aplicativo! Você pode trabalhar aqui, ó. Esse é o nosso aplicativo.
S: Então, esse aqui?
R: Não. Aqui. A partir da faixa azul prá baixo.
S: (Finalmente entra na tela inicial do aplicativo. Som característico de abertura) Ah, OK.
R: Você pode mexer, fazer o que você quiser. Lá fora é outro... outside.
S: (Está no menu e lê): Cognatos...Interessante (E clica em cognatos)
R: (Dando um prompt): Ah, agora você está em cognatos: explicação, në?
S: Ë.
R: Tá.
S: Hum... (Lê em voz alta)
R: Aí você clicou no link SEMELHANTES, né?
S: Exato. (Lê em voz alta)
R: (Dá outro prompt): Clicou no link de cognatos verdadeiros.
S: Quero voltar prá ver os falsos, então.
R: OK, clicou no link de falsos cognatos.
S: (Lê em voz alta a explicação de falsos cognatos). Clica.
R: Aí você clicou de novo nos cognatos verdadeiros, não é?
S: Agora cliquei nos exercícios de cognatos.
Lê em voz alta o enunciado do exercício
R: Scanning você sabe o que é, né? Scanning é só aquela leitura rápida
S: (murmurando que sim). Tem que ler o texto?
R: Não, só o scanning.
S: Hum.
R: Você tá procurando o quê? É cognato? Então fazendo só uma geral você vê.
S: Murmura: Tô procurando os cognatos.
Vai tentando algumas palavras em voz alta.
S: Esse aqui...eu não sei o que é mas vou botar, né?
R: O quê? Qual?
S: (sujeito fala a palavra) Eu não sei como se pronuncia (e vai digitando)
R: Não importa a pronúncia. Você tá procurando aí é a semelhança
S: É, acredito que seja. Hummm... (e tenta outras palavras. Escolhe uma: Brutal). Acredito que seja a mesma coisa (digita. E vai murmurando outras palavras. Digita). Vamos corrigir.
Dá Resposta Errada
S: (Lê a explicação do erro na tela).
R: Porque 'rapidly' é um cognato, 'brutal' é um cognato, mas 'casualties' não é cognato...não é um cognato. Porque você tá achando que 'causualties' é o que em Português?
S: Casualidades.
R: Casualidades. 'Casualties'é um falso cognato. É o número de vítimas em uma acidente, por exemplo. São as casualties...número de acidentados...As baixas, digamos assim.
S: Ah. Achei um pelo menos! (rimos)
R: É, pois é! OK
S: Tá. (Lê em voz alta a tela que clicou): Let's have some... fun
R: Você escolheu essa aí. OK

S: (Suspira) Tá, tudo bem. (Lê a estória do surfista em voz alta. Ri). OK. Hummm. Agora prá frente. (Vai para a tela do menu. Leva o mouse para Palavras-chave). Palavras-chaves: explicação, exemplos...(vai murmurando os itens).
Clica em explicação e lê em voz alta.
R: (Dá um prompt) Então você clicou agora prá... fazer os exercícios, né?
S: ...fazer os exercícios, é. (Lê em voz alta o enunciado da task 1): Hummm...Ah... (sorri e imediatamente digita THAT).
R: ...Na sua área de atuação. Mas THAT significa o quê?
S: ...pois é, porque...
R: Por exemplo: se eu fosse médica eu diria que seria humm...CIRURGIA, HOSPITAL...
S: Ah, tá. Então: BOOK, Humm, STUDY... emm, humm, ..TEACHER.
R: Mas não é em qualquer área que o teacher funciona? Ela não é específica da sua área de atuação.
S: (Menciona outra: inaudível)
R: Ah, bom, tudo bem.
S: (digita). (Procura como confirmar suas respostas)
R: Pesquisador explica que não há validação para essa questão.
S: Ah, tá. Hum, Hum.
R: E agora?
S: Vou prá frente de novo.
R: Prá frente.
S: Deixa só botar tudo...(inaudível)
Vai para o menu novamente
S: Conhecimento Prévio
R: Isso, você tá rolando prá frente no conhecimento prévio.
S: Isso. (Foi para os exercícios) (Murmura o texto e tenta responder). Pelo título, eu botaria POLITICA (Ri) Mas vamos ver (e ri novamente). É? (ri novamente buscando a resposta noa pesquisadora).
R: (Sorri) Não sei.
S: (Sorri) Não sabes? (Vai para a Segunda parte do mesmo exercício : palavras chave que evidenciam a escolha feita acima). Humm...(Digita). (Decide): É (e digita). (Digita outra palavra) (E outra): 'Leader' . Será que dá prá copiar? (tenta usar o recurso de copiar e colar. Não consegue) Acho que não. Corrigir. (Resposta correta para a primeira parte do exercício. Nós rimos. Corrige a Segunda parte do exercício: erra as três. Lê:) Não evidencia a escolha/não evidencia a escolha/não evidencia a escolha. Tá, então...Não tô muito feliz nessa... (Sorri)
R: Não, é isso aí. Aqui não é prá testar nada, não, sabe.
S: Hã, Hã. É, acho que...
R: (Dá um prompt): Voltaste pro...
(Sujeito vai para a página de abertura. Sai. Vai de novo. Aparentemente dá como terminada a tarefa).
R: Tás na página inicial.....
S: Só se a gente fizer mais alguma coisa disso aqui (está na página do menu).
R: Isso tu que decides... Tás na página inicial agora...
S: Sim. Será que eu posso ver outra coisa do fim? Posso?
R: Você é livre prá fazer o que você quiser.
S: Então...(examina a barra no topo da tela e vai murmurando: índice/som/caixa de correio...). (Tenta usar a caixa de correio. Não há mensagens.) Então...
R: Fecha! (Rimos).
S: Ah, vamos ver mais alguma coisa, então. Humm...Let's have some... fun
R: (Dá um prompt) ...das palavras-chave, né?
S: É.
R: OK
Vai murmurando o texto.
S: Eles falam 'a pair of pants' né?
R: Sim, mesmo em português a gente fala 'um par de calças', um par...um par de luvas...
S: Sim, um par de luvas porque tem duas, mas um par de calças, não, porque é uma só.

R: É porque a gente tá deixando de mão...Por exemplo, hoje em dia, na padaria, a pessoa diz: "Me dá um leite", né?
S: Sim
R: ...quando deveria dizer "Me dá um litro de leite"... a .. a linguagem está se tornando muito rápida.
S: Sim...mas ao mesmo tempo...
R: O certo, certo, é 'um par de calças', né, porque tem duas pernas...
S: É, porque...assim... Eu não vejo...
R: (Ela clica voltando uma tela. Pesquisadora dá um prompt) Vais voltar?
S: Vou voltar
(Decide não ler mais. Abandona esse texto e vai para a tela inicial).
R: (Dando um prompt) Palavras-chave...
S: Quero ir para a tela inicial.
R: OK. Tu estavas procurando a página inicial. Chegaste à página inicial.
S: Vou ver o...'Let's have some fun' ...(sorri).
R: Hummm...Todo mundo que chega aqui só quer ver isso, në?!! Sorrimos. OK. Então tu tás no FUN do Conhecimento prévio.
S: É. Acho que é muito grande...(inaudível).
R: (Dá um prompt) Voltaste prá...
S: Voltei prá página inicial. Chô vê... Vou ver os exemplos de Conhecimento Prévio que eu não vi. (Lê em voz alta a estória do exemplo 1).
S: Aquele é o exemplo? Isso é exemplo?
R: É. É um exemplo.
S: Eu não entendi o exemplo, então. (Inaudível)
R: Você está em conhecimento prévio, né?
S: Isso.
R: (Dando um prompt) Tá lendo de novo o exemplo número 1...
S: É (lê alto parte do enunciado do exemplo 2): "Veja o que se pode inferir da estória abaixo." Eu não consigo relacionar isso com o coisa de... (R: conhecimento prévio) Ah, tá, de conhecimento prévio, tudo bem.
R: Então, a gente não tá trabalhando com conhecimento prévio?
S: É, só que eu tava pensando em outra coisa.....É tava pensando em outra coisa mesmo. Tá, vou voltar prá página inicial...
R: Página inicial...
S: Voltando...acho que já fiz todos eles...Não, vou ver exemplos de palavras chave.
R: Então tu tás em exemplos de palavras chave...
S: É
R: Tá.
(Vai murmurando as palavras chave negritadas no texto: contemporary, management, entrepreneurial success)
S: São palavras chave de 'marketing' philosophy? (título do extrato) Tu vê, não parece.
R: Porque isso aqui é uma coisa...[S: competitors] uma coisa... que você toma o marketing hoje em dia como uma tendência muito comtemporânea...antigamente não se falava em marketing. Então, o aspecto 'contemporaneidade' é chave...
S:...é, 'business' também... 'management'...Todas elas são...é...
R:...quer dizer, falar de 'marketing' sem mencionar 'business' é difícil, e assim por diante.
S: Tá, voltar prá página inicial e ver exemplos de...humm...exercícios de (inaudível) eu já fiz...isso aí eu já vi tudo... (vai explorando o meu com o mouse ...) Fiz exercício de conhecimento prévio, eu acho... Ah, fiz exercício de conhecimento prévio, sim. Então, acho que já fiz tudo.
R: É, então tá. Então a gente vai terminar agora, OK?

Subject B

Tela de abertura

S: (sujeito lê o título do aplicativo): Reading strategies for business.
R: (dando um prompt) Você tá na página de abertura, né?
S: Hum, hum. Que é isso?
R: O que que é que você fez?
S: Cliquei no que eu acho que seja o ...
R: Clicou no... na tela inicial... no menu, tá, OK.
S: Hum, hum.. (Vai lendo em voz alta os itens do menu): Cognatos, explicação, exemplos, let's have some fun (Rimos). Esse parece mais legal (Rimos). Gostei. (Continua lendo o menu) Palavras chave, conhecimento prévio. Conhecimento prévio, explicação, exemplos, exercícios. (Clica) Explicação.
R: (dando um prompt): Tá, então você clicou agora no...conhecimento prévio...explicação.
S: Ah, tá, eu digo quando eu cliquei...
R: ...é... tudo...cliquei nisso, cliquei naquilo.
S: Eu vou ler, então, a explicação. (Lê em voz alta). (Lê): Clique aqui para ver uma dica (Mas não clica na dica). Eu vou clicar em 'componentes essenciais' (link encontrado na tela de explicação de 'Conhecimento prévio'). 'Primeiras estratégias' (lê em voz alta toda a tela). Em qualquer uma que eu entro eu caio no...(inaudível). Vou voltar.
R: (dando um prompt): Então você voltou prá tela inicial, né? OK.
S: É, eu quero voltar práquela tela onde eu escolhi (tela do conhecimento prévio). Ué...ele pula a tela...aquele texto que eu li antes... cadê? (entra na tela de abertura). Eu não posso entrar nele de novo?
R: Pode...
S: (tenta e consegue. Sorri). Conhecimento prévio, vou entrar em 'explicação' (Sorrimos)
R: Hum, OK. Então você voltou prá conhecimento prévio – explicação.
S: Isso. Porque quando eu entro em 'componentes essenciais' ele me dá as estratégias, me dá as pistas, então eu quero ver quais são as pistas.
R: Certo.
S: O texto é outro?
R: Quais são as pistas, você vai ver quais são elas.
S: ...cai no mesmo texto. Qualquer um que eu clique lá cai no mesmo texto.
R: Porque você queria ver 'pistas' e essas são elas.
S: É, quando eu pedi 'explicações' caiu aqui também, na mesma página. Então na verdade eles formam um grupo(?) desse menu aqui. (Clica nos ícones listados com as pistas para ver o que tem). (Lê em voz alta).
Vou clicar em conhecimento prévio.
R: Certo.
S: E eu caio em palavras chave...
R: Você clicou em conhecimento prévio? Tem certeza?
S: Acredito que sim, né. Eu vou voltar...(Clica em) Let's have some fun (de palavras chave). (Lê em voz alta o enunciado e o texto). (Faz comentários): ele não estava surfando...(Risos)
R: Se você não quiser ler alto, tudo bem, mas eu quero que você me diga aqui assim, ó, "eu tô lendo agora"
S: Sim
R: Eu quero que você me diga o que você tá fazendo.
S: Ah, eu tô lendo o texto. (Vai lendo baixinho e comentando): se fosse um cachorro de rua, ele não ganha nada. (Rimos). (Continua lendo baixinho. Ri). Sacanagem.. Acho que ele ficou meio perdido.
R: É...(rimos).
S: Bom, eu já vi que ele vai prá onde ele quer, então, vamo ver... Eu tô procurando 'explicação'... Caí nas palavras-chave, 'explicação'.

R: Isso. Hum, hum
(Lê toda a explicação em voz alta)
S: Não, vou voltar pro meu menu. (Clica). (Lê o meu): Cognatos, palavras chave...Vamo ver qual é a piada do cognato, então. (Rimos). (Lê): "Num campeonato no Havaí..." caí na mesma. É "let's have some fun" mas eu tenho fun uma vez só. (Rimos). (Volta para o menu) . Vamo ver: palavras chave, let's have some fun. (Lê alto).
R: (Dando um prompt): Então você está em palavras-chave, o 'fun' das palavras-chave.
S: ...das palavras-chave. (Lê baixinho o texto). Agora eu viajei!
R: É? (Rimos). Fala essa expressão bem depressa.
S: Pair of docks?
R: Hum hum, de novo.
S: pair of docks.
R: São aquelas palavras em português que a gente repete e de repente tá falando outra coisa. Pair of docks, pair of docks...
S: Paradox?
R: Hum, hum! (Rimos). É só uma brincadeira com o ...
S: Sim, falta o meu inglês... Eu vou voltar pro meu menu agora.. Eu quero ver o 'Let's have fun' do Conhecimento Prévio. Tô clicando, entrei nele. (Lê em voz alta. Vai rindo enquanto a estória se desenrola). (Lê alto o Postscript).
R: (dando um pronpt) OK, então você leu o PS do 'Fun' também, né? E agora?
S: E agora... Ah dá prá clicar aqui do lado (barra de icones no alto da tela do aplicativo).
R: Hum, good (rimos). (Lê os itens listados lá): Let's have some fun, aqui não dá...explicação, exercícios. Entrei em exercícios...
R: ...de conhecimento prévio, né? Right.
S: Isso. (Lê em voz alta os títulos dessa tela): Primeiras estratégias, conhecimento prévio, exercícios. Task 1, Links para outras tarefas. (Lê o enunciado da task 1): "Leia o text... Leia o extrato abaixo cujo título é 'Saddan Hun Sen'. Saddan Hun Sen? Indique a área em que o texto se insere". Eu vou ler o texto... (Lê em silêncio) Terminei de ler, mas não tenho certeza. Eu vou ler as opções e você tem que relei o texto. (Lê o enunciado): Indique a área em que o texto se insere: Econômica, política, acadêmica, médica. Eu acho que é política mas eu vou ter que reler. (Vai relendo em silêncio). Tem um monte de palavra diferente ...(fica em silêncio por um longo tempo lendo).
R: Tu tás relendo o texto, né?
S: Hum, hum. Se eu soubesse o que é 'coup'...(Sorri)
R: É 'golpe'. É uma palavra francesa que é usada prá 'golpe'. 'Golpe de estado', essas coisas. Você vê como ela é uma palavra chave...
S: ...palavra chave...me fez falta!... (Sorri).
R: Pois é, (ininteligível)..quando você estiver dando uma olhada noutras palavras chave...
S: Sim... Ai, eu acho que é 'política'. Bom...
R: Você marcou 'política'...
S: Marquei 'política' e a minha palavra chave agora é o (inaudível).
R: Mas aqui, ó...(R mostra o quadrinho 'corrigir')
S: Não, mas eu não errei...eu não quero trocar
R: Você não quer corrigir, não quer saber o resultado? Se você acertou?
S: Ah, é isso? Eu achei que se eu quisesse apagar, botar em outra opção, eu clicaria aqui prá corrigir. Se você quiser saber, né...
(ela clica e o resultado é correto). (Ela sorri).
S: Eu vou fechar essa janela (da correção) (continua a fazer o mesmo exercício)... e vou botar aqui minha palavra chave que me fez falta lá...e (volta a ler o texto para achar mais duas palavras chave). Eu não sei o que é 'cacophony' mas aparece só uma vezinha...
R: Não parece com nada em português?
S: Esse 'caco-' aí eu não consigo relacionar...Cacofonia?!!! (Vai lendo baixinho). Estou procurando as palavras chaves... essa acho que eu vou errar...estou escrevendo na segunda aquele ...aid... (soletra): a-i-d, não sei o que é isso... (procura a terceira palavra). É a que mais me fez falta foi essa primeira... agora não sei mais o que pôr...tô colocando aquele 'donor'...deixa ver se eu escrevi corretamente(checa no texto)...no plural...donors...agora ele vai me vaiar, vou clicar em corrigir ...

(Rimos). (Erra). (Rimos) É, ele me rejeitou as três. Então, vou mudar... esse teclado é diferente do meu... eu vou colocar...'government', vou colocar...
R: ...você tá tentando de novo, né?
S: ...tô tentando de novo.
R: Tá. OK.
S: (Digita) Ôpa, ...errei...esqueci como se escreve...C-...esquisito...de cunho político...(digita). Eu esqueço como se escreve...xô vê...tô lendo 'officially'...como se escreve...aqui eu esqueci um 'a'... Agora eu vou pegar e corrigir... (Erra novamente. Lê): Não evidencia a escolha, não evidencia a escolha, não evidencia a escolha. R: Ah, mas você melhorou...Só o (???) que você não acertou!
S: Hum...Vamos ver...o meu 'golpe' lá, já vi que não é. Aquelas palavras que eu desconhecia e me fizeram falta, heim, no cunho político. Agora eu tô relendo o texto prá procurar essa última palavra chave...country...i-y-i, sou aluna da primeira fase, não vale rir. (Rimos).
R: Não tô preocupada com o teu inglês...!!! (rimos)
(Ela corrige e erra novamente)
S: De novo? Não!. Ah, eu sou chata, não desisto. (Ri). Eu vou ter que acertar. Vou digitar todas e nenhuma sobra... 'elections'...
R: Tem a ver com política?
S: Ah, isso é 'eleições', sim! Ah, eu li rápido e li outra coisa! (rimos). (Digita) Essa tem que tá [certa], fui ajudada. (Corrige) (Dá errado novamente). Oh, oh. (Rimos). Vamos ver. Vou reler o texto prá procurar outra palavra...se for United States...(ri) não, não pode, eles não podem ser tão influentes assim.
R: Tenta essa expressão: 'Second prime minister'
S: (Digita) I have a problem...
R: Será que é muito grande?
S: Acho que nem adianta tentar corrigir... (Corrige e dá errado).
R: Tira o 'second', deixa só o 'Prime Minister' , talvez seja porque é muito grande e não dá espaço...
S: ...minister...Corrigir (dá errado de novo). Eu acho que ele tá de sacanagem comigo!
R: É, também tô achando...Tudo bem , tudo bem...
S: (Relê baixinho) . Eu tô relendo...'democracy', 'power grab' . (Digita algo e carta). (Fica feliz e ri). Fechar a janela. Ah, já fiz esse, eu quero fazer mais exercício. Agora, eu vou voltar pro menu...e entrar nos exercícios dos cognatos. Vai ser divertido prá ver as respostas.
R: (dando um prompt): Então você tá na Task One dos Cognatos, né? Os exercícios de cognatos, né? All right
S: (Lê em voz alta o enunciado)
R: 'Scanning' você sabe o que que é, né?
S: ...uma leitura rápida...OK. Vale o nome de país?
R: I don't know.
S: Deixa eu ver aqui primeiro qual é. Digitei 'coffee'. Ôpa, esqueci o 'f ' de 'coffee', tô arrumando...
R: Vê se 'coffee' é cognato, né...
S: Agora...eu vou digitar...'industry', 'indústria'...e ... 'governo' de novo. Eu tinha colocado uma outra terceira palavra...ôpa...ôpa!
R: ... 'r n' aqui, ou 'm ' aqui? Não, um 'm' é que eu tinha... eu vi de longe e achei que era um 'n' aqui...É 'govern' com r , n e depois –ment. Mas eu tô vendo dois 'n'...
S: É o tipo da letra que dá a impressão...
R: Ah... desculpe. Não, não, não, tudo bem. OK, é, tem razão.
S: ...qué vê, eu vou botar ele aqui no meio...Vou corrigir... (Dá errado).
R: Mas os outros dois você acertou...É que a gente já está tão acostumado a saber o significado que acaba achando que é mesmo.
S: É.... Vou ver o que é (ininteligível) lá em cima. Patrocínio...Patrocínio é em Inglês e está acentuado. Tô relendo o texto , então, prá ver se eu encontro um outro cognato. 'Brazil' não pode ser um cognato, né? (Vai murmurando a leitura). Ah essa palavra tá esquisita, vou ler o resto, daí eu tento...eu tento ela (ri). Vou tentar o 'décadas' aqui... Agora eu vou corrigir o 'décadas' (Dá correto). (Ri).
R: E agora?

S: Não tem mais exercício...eu voltar pro meu menu principal... e vou pegar ...o exercício da palavra chave eu já fiz... Não, fiz do conhecimento prévio...Hum...não lembro. Eu vou entrar no exercício de palavra chave...Não, eu vou entrar no de conhecimento prévio...acho que é esse que eu não fiz. Deixô vê o que tem a página...Ih, esse eu já tinha feito. Então eu vou sair do exercício do conhecimento prévio, vou voltar pro menu principal... vou pegar o exercício das palavras-chave. Agora eu tô nessa página...tá esquisito...
R: (dando um prompt): Task One de palavras-chave, né? Exercícios.
S: É. (Lê em voz alta o enunciado): "Digite três palavras que você considera chave na sua área de atuação. " Na minha área de atuação?
R: No seu curso.
S: Ah... (digita uma palavra. Ininteligível): ???? tá escrito correto?
R: Sem o 'n' o primeiro 'n'
S: Essas palavras precisam ser em inglês?
R: É, pode ser em inglês, em português... Esse é um exercício aberto. Quer dizer... como as pessoas que vêm aqui, cada uma é de uma área diferente, então não há validação, quer dizer... não posso...tem 500 milhões de respostas, entendeu? Mas é prá pessoas pensarem sobre as suas próprias ...
S: Então, deixa eu vou escrever em português, assim eu não erro. (Risos). Vamos ver... 'escrever'. 'Escrever', não, 'redigir'. 'Redigir', pulei uma linha, 'ler', 'leitura'. 'Leitura' e 'didática'. Cadê o acento? Não tem tecla de acento?
R: ÉEE, Esse aqui, não?
S: Isso são aspas.
R: Não.
S: É? Primeiro o acento, depois...(a letra).
S: Ah, eu não vi. 'Didática'. Esse aqui não corrige...?
R: Não, não corrige. Esse é de pensar. Cada um que chega e pensa...
S: (Ri) Sim... Deixa ver prá onde eu vou...Eu vou pro 'Let's... Não, o Let's have some fun' eu já fui em todos. Vou pro 'Exemplo' das palavras-chaves. Cliquei. Agora tô... (Lendo na tela): Primeiras estratégias, Palavras-chave, Exemplos. Exemplos de palavras-chaves...eu vou ler o texto...(silêncio enquanto lê).....(Comenta): Hum...a competição pelo mercado faz eles pensarem em tudo, né?...Xô vê...Eu vou pro aplicação...explicação das palavras chaves porque acho que é o único que eu não entrei ainda. (Lendo a tela) Primeiras estratégias, palavras chave, explicação. Lendo o texto...(em silêncio). Hum...eu vou voltar pro meu menu principal...acho que eu vou deixar...isso eu já fiz tudo...tem cognatos...cognatos, dessa vez eu vou prá 'explicação' antes do 'exemplo' (ri). Eu tô indo primeiras estratégias, cognatos, explicação. Agora é um texto...(lê em silêncio). É um dos meus (????????) cognatos falsos, tô ferrada (rimos). Agora eu tô indo pros exemplos dos cognatos. (Lê a tela): Primeiras estratégias, cognatos, exemplos. Tô lendo o texto...Nossa, eu não sabia o que era esse 'morose' , em português também não sei o que é 'moroso'!! (ri).
R: É uma coisa lenta... (Dou um exemplo): O tribunal tem um serviço moroso. Vagaroso.
S: (Vai lendo murmurando). Ah, se eu for fazer uma prova, só vão botar os falsos!!! (Rimos). Ou então (inaudível). .....Já estive aqui antes...eu vou pro meu menu principal. Cognatos...Sabe o que devia vou fazer? Devia ficar vermelhinho o que a gente já entrou, prá gente lembrar. Vou ver ...palavras chave...palavras-chave eu já fiz tudo...Tô entrando em Conhecimento prévio, Explicação. (Lê): 'Primeiras estratégias, conhecimento prévio, explicação'. Eu vou ler o texto...(lê em silêncio). Eu já li esse texto. Então eu vou ver a 'Dica' aqui que a Explicação de Conhecimento Prévio me dá. Dica. (Lê em voz alta). Hum. (inaudível). Eu vou entrar nos exemplos do conhecimento prévio... (Lê a tela): 'Primeiras estratégias, conhecimento prévio, exemplo 1' . (Lê o enunciado em voz alta) (lê o texto em silêncio. Ri. Explica o que leu: o texano não entende o que é escassez, porque eles criam, o russo não entende o que é carne porque lá é escasso e o nova-iorquino não entende o que é 'excuse me' porque não estão acostumados com essa gentileza toda (rimos). Eu vou pro exemplo 2. Aí vou ler o texto... (lê em silêncio). 'FT' esse aqui é mais difícil da gente ler. É inglês, a gente desconhece...
R: Você sabe o que é o FT?
S: Não.
R: O Financial Times. É o jornal econômico inglês de muito prestigio.

S: Hãn, hãn. (Lê em voz alta "O que o leitor precisaria saber para entender o texto: o que é FT, o que é Earl Grey..." não me lembro direito dessas coisas... (Volta ao texto). Ele achou que era algum tipo de comida? (Continua a ler a explicação): "Perceber que a estória se passa em Dublin; Ter conhecimento sobre as relações inglesas e irlandesas no tocante ao 'QI' dos personagens..." não acho que eu não vi...acredito que não...Bom, é como a gente contar piadas de portugueses e alguém não entender...
R: Lá eles têm esse tipo de ...'implicância' também.
S: É...
R: Você vê que é só um exemplo de tudo o que a pessoa precisaria ter na cabeça guardado prá quando fosse ler aquela estorinha, tão pequeninhinha.
S: É. (Lê): Clique aqui para ver uma Dica. Vou ver uma Dica. (Lê em voz alta).
R: Você entendeu isso?
S: Hãn, hãn.
R: A mulher pediu FT e ele achou que ela estava pedindo Tea...
S:...como se as mulheres não tivessem nada mais importante do que...tomar chá.
R: ...ele jamais pensaria que ela fosse pedir um jornal importante prá ler...
S: Sim
R: porque é uma mulher!. Afinal, mulher só faz tricot e toma chá! Agora se fosse um executivo, um homem, ele nunca ia pensar que ele tava pedindo um chá...
S: ...ainda mais na Inglaterra, né? Um cara pedindo um chá!
R: então, em relação aos irlandeses que eles pensam que são burros, então só podiam ter entendido errado mesmos. (Risos). OK?
S: Sim. Então, vou pro exemplo 3. 'Saddam Hun Sen?' (Ri). Aí, vou ler o texto...(Lê em silêncio). ...os nomes mais quebrados, as palavras mais quebradas...Ah, esse aqui é mais sem graça... R: Pois é, pmas prá você entender isso aqui, que é uma sentença, três palavras, teria que Ter tudo isso armazenado na sua cabeça, entendeu.
S: Eles tão tirando um sarro daí só porque eles estão com problemas, etc. e tal, mas... os outros (os outros textos do aplicativo) eram mais legais. Vou ver uma dica.
R: Tá.
S: (Lê em voz alta). É, acho que é a mesma coisa. Agora eu vou...agora para... acho que os exercícios de conhecimento prévio, acho que eu já fiz. Só prá lembrar...eu vou entrar nos exercícios do conhecimento prévio...exercícios...isso aqui eu já fiz...eu ainda não fiz o 2. Vou entrar no exercício 2. (Lê em voz alta): A que acontecimento a sentença abaixo se refere. Vou ler a sentença...NASA? Columbus?
R: Fala o que você quiser!
S: (Lê a sentença) Columbus was powerless against the weather. Vou ver uma dica primeiro então, não sei. (Lê a dica em voz alta) . Não ajudou muito nessa questão.
R: É...te dá uma coisa muito ampla, né? Cada pessoa que senta aqui conta uma estória diferente ou entende diferente. Se forem mil pessoas são mil respostas, entendeu?...Tudo depende do seu conhecimento. Outra pessoa tem outro conhecimento. Cada pessoa tem o seu.
S: (Fica murmurando hipóteses): Challenger? (e vai tentando achar uma explicação . Vai murmurando) Você trouxe dez fitas, né? Porque eu fico...
R: (Rimos). Take your time. Eu comprei cinco fitas...então tem horas de gravação prá você!!! (Rimos).
S: Xô ver aqui... (fica pensando). Colombo? Num dia de calmaria tem menos poderes, Eu tô digitando "o descobrimento da América"
R: Esse não tem correção, tá?
S: Eu tô no exercício 3. Primeiras estratégias do conhecimento prévio. Vou ver a dica prá ver se tem alguma coisa a ver. (Lê em voz alta). É, ele tá me incentivando. (Rimos). Vamo ver. Vou ler o texto primeiro. (Vai tentando achar a melhor opção para preencher o texto). Aqui eu tenho sete palavras...(vai murmurando o texto) Eu acho que...(escolhe uma palavra) vamos ver, se precisar dela de novo...(ri) O que é isso aqui, heim?
R: Avaliar, fazer uma avaliação.
S: Hum. Eu vou trocar. Ai, esse aqui é chato! (vai murmurando o texto em busca de soluções). Eu vou Ter que corrigir prá ver se ele preenche prá mim. (Ri). Daí quando eu souber a resposta certa preenchida. Vamo ver se eu já acertei alguma? (Dá erro).

R: OH! Duas!
S: ??eu acertei...
R: Duas verdes tu acertaste...
S: O verdinho é que eu acertei...1,2,3,4 (erradas) e essas duas aqui estão corretas. (Tenta de novo. Errado novamente. Mas o número de acertos aumenta). Um já foi! (Vai tentando murmurando. Checa de novo. Errado. Ri.). Tenta outras escolhas e corrige. Errado. Tenta outra palavra. Errado). Ah, agora eu piorei, só faltavem duas, agora faltam três.
R: É que você só precisava trocar a ordem e o que você fez doi botar outra palavra.
S: Deixôver. (Vai tentando) Errado. Agora, sim. Vou trocar. Corrigir. Errado. Oh...
Ah, sacanagem, ele não obedece à mesma posição das palavras (ela estava se orientando pelo mesmo layout na tela de resposta do texto, mas este é diferente!). A correção não tem a mesma posição das palavras!
(Corrige. Acerta.). Ah, eu olhei pela posição!
R: Mas, gente, esses alunos, eu vou te contar (Rimos). Eles estão sempre à frente.
C: Agora eu vou pro exercício 4, que eu acho que é a única coisa que eu não fiz ainda. Eu tô no exercício 4, primeiras estratégias de conhecimento prévio. Deve ser mais difícil ainda esse aqui. Eu vou ler o texto...(fica em silêncio lendo). Vou ver a dica. Não vai servir muito, mas...provavelmente...(Murmura a dica). Não... (Tenta marcar a resposta do exercício). Corrigir. (Acerta). Ri.
R: O que te levou a acertar?
S: São países em desenvolvimento, aliás bem desenvolvidos prá ter uma incidência de doença em todos esses países ??? controle. A crise econômica não é porque o demonstrativo aqui no gráfico tem crescido, só se fosse crescido a dívida, mas...não sei, acho que Portugal deveria ter uma dívida maior que a Alemanha, por exemplo, ou a Itália, são países ricos e o índice de analfabetismo, eu acho que 21% é muito grande para um índice europeu, e a participação da mulher no mercado, ele pede prá eu usar os cognatos...não tem nada que possa se referir ou relacionar com mulher...a participação da mulher... por eliminação eu escolhi o desemprego que a Alemanha tem desemprego, não é só a gente... Vou voltar pro meu menu principal, tô no menu principal...eu acho que já fiz tudo.
R: OK. Thank you.

Subject C

Tela de abertura

S: UnB? Universidade de Brasília? É federal?
R: É, é. Porque lá, na verdade, eles não chamam de federal, porque é a universidade no Distrito Federal. É a federal de Brasília...
S: Hãn, Hãn.
R:...só que ela não leva o F, não é...Na verdade o plano era prá ser Universidade Nacional do Brasil, mas já tinha no Rio, a patente, eu acho, do Darcy Ribeiro, então o N teve de ficar como N de universidade também.
S: Hã, Hã. (Vai prá tela do menu. Lê em voz alta): Primeiras estratégias, cognatos...Acho que que vou em tudo, né, prá ver o que é que tem que fazer...Começa daqui, né?
R: It's up to you.
S: Hum... (Lê): Estratégias básicas...
R: Bom, você tá fazendo o que aqui nessa tela?
S: Tô lendo. (Continua lendo alto)...para começar a apreender o conteúdo de um texto. Eu preciso ler também em voz alta?
R: Não, do jeito que você quiser.
S: Tá, então eu só preciso dizer "Ah, eu entrei nas primeiras estratégias, é, cognatos, explicação, e tô lendo."
R: Hãn, hãn.

S: (Silêncio enquanto lê). Tá, OK, vou voltar, então. Agora eu vou prá exemplos. Exemplos de falso cognatos e agora eu vou ler também. (Lê em silêncio). ...Tá, 'morose'... Certo... e agora eu vou prá...exercícios. "Primeiras estratégias, cognatos, exercícios", tá OK. (Lê em voz alta): "Digite 3 cognatos que você encontrar." Vamos ver...(Vai lendo o texto em silêncio). Achei um cognato aqui, 'industry', hum... deixa ver se tem outros...(Vai lendo murmurando) (Silêncio enquanto procura)...Hum... vai murmurando e digitando...'controlling'...acha que aqui, OK. Agora vou prá outra parte, então, LET'S HAVE SOME FUN. (Lê o título da tela) Primeiras estratégias, cognatos, Let's have some fun. (Lê o texto em voz alta): " Deu no JB (vai lendo em voz alta. Ri). OK. Então eu vou voltar pro menu principal, prá tela anterior, não sei se é o menu... é acho que é o menu principal. (Tenta voltar): Vou voltar prá outra... Não tá voltando...Não...Aqui...Menu inicial...vou fazer a parte 1.2 Palavras-chave, explicação. (Vai pra tela de palavras-chave. Lê em voz alta os títulos da tela): É... Primeiras estratégias, palavras-chave, explicação. (Vai lendo baixinho, silêncio, Hum. Tá, agora eu vou prá exemplos de palavras-chave. (Silêncio enquanto lê)Tá OK, já li os exemplos, agora vou pros exercíos de palavras-chaves. AH...na minha área de atuação...Bom, já que eu sou estudante de engenharia química, três palavras-chaves...é indústria,...a primeira palavra-chave, mesmo é engenharia mesmo...(digita e fala): engenharia, Ahhh...indústria...e...já que eu tô trabalhando numa pesquisa sobre petroquímica, então, petróleo. OK. Agora eu vou prá Let's have some fun. (Silêncio enquanto lê.) Pair of docks...(Não entende o porque da expressão).
R: Fala essa expressão bem depressa
S: Pair of docks...
R: Mais...
S: Pair of docks...pair of docks...paradox. (Ri).
R: Of course this is just fun
R: OK, então vou voltar pro menu principal. Agora eu vou prá conhecimento prévio, item 1.3 Explicação. (Em silêncio, lendo). Tá, vou clicar no final do texto prá ver uma dica. Uhmm...OK. Agora eu vou prá exemplos de conhecimentro prévio. (Lê em voz alta):" Deu no NYT". Eu tô vendo o exemplo 1. "Excuse me... (vai lendo em silêncio. Ri). OK. Vou ver o exemplo 2. (Vai lendo murmurando e depois em silêncio). "FT?" (Ri). O que que é FT...(inaudível)? Ah, tá aí em baixo. (Lê parte do enunciado do exemplo): "o que o leitor precisaria saber para entender o extrato: _ o que é FT...". Ah, até não precisa saber o que que é isso prá entender porque deu prá ver que era pela pronúncia ...an FT...e daí o cara confundiu com alguma coisa 'tea', né, um chá de alguma coisa (Ri).
R: Hã, hã, OK.
S: Perceber que a estória se passa em Dublin (Ri). Vou clicar prá ver uma dica. (Lê em voz alta).
R: FT é o Financial Times.
S: Ah, tá, hum.
R: Se fosse um executivo ele não pediria 'chá', né, mas como o personagem da estória é uma mulher, daí só podia pedir...(ri).
S: Ah, então, no fim tu precisava saber o que que é FT mesmo.
R: É isso que tá demonstrando aqui, como é importante você ter conhecimento dessas coisas prá poder sacar...
S: Entendi, entendi...Então vamo ver o exercício...(Lê o texto em voz alta) "Saddan Hun Sen? (Ri)" (Lê em silêncio). Hum... 'Coup'?
R: É uma palavra francesa ...'golpe'
S: Ah, tá. Hum. Tchii...Hum. (Procura a resposta para a primeira questão): ...política... Vamo ver (digita), vamo ver o próprio 'coup', né, o golpe... Primeiro ministro...re-election...(digita). Just 'elections', né, também não precisa ser exatamente política, né... Ah, eu não vou responder aquela...(Ri). Let's have some fun., é melhor. (Lê em voz alta o texto, murmura, depois lê em silêncio). Ri. (Clica em) Postcript... Ah, OK. Vamo ver agora... Bom, no men...vou voltar no menu principal prá ver se tem mais alguma coisa... Aqui não tem , tá já fui prá frente, já fui prá trás, aqui... não...Caixa de correio, vamo ver o que pode ter de emocionante aqui...É isso aí?
R: É se tu queres que (inaudível) dos títulos.
S: É, mas é a única coisa que entrou aqui (Ri). Vamo ver, prá anterior... (entra na tela de abertura com música). OK (volta para o menu) Menu...Ah, isso aqui eu já li...'Primeiras Estratégias' (explora a barra superior, desliga e re-liga o som): não, eu não vou desligar o som (Rimos), o Correio... Caixa de mensagens...

R: ...é que no futuro a gente vai fazer o aluno mandar um e-mail pro colega, sobre alguma dificuldade, ou pro professor, o professor responde...
S: Ah, tá, é, pelo meu log-in eu poderia participar...
R: Exatamente, é. Tipo uma Internet...só...particular. Entendeu?
S: Ah, tá. (Clica na tela de abertura).

Subject D

Researcher: Tela inicial, né?
Sujeito: Tela inicial, explicação.
R: (Dá um prompt) O que é que você está fazendo?
S: Tô rolando na... Ah, precisa falar tudo isso? Então, tá. Tô rolando na tela prá acabar de ler as primeiras estratégias, cognatos, explicação. .....Vou clicar aqui para estratégias básicas. Primeiras estratégias. Vou rodar.....
Vou clicar em cognatos. Voltei na ...
R: Voltaste?
S: Voltei. Vou pegar PISTAS. .....Isso aqui já não tava naquela outra parte também?
R: São as pistas, né?
S: Ah, tá. Palavras chave
R: (Dá um prompt). O que é que você está fazendo?
S: Lendo palavras-chave.
R: OK
S: Palavras-chave.....Prá voltar pro texto tá faltando uma coisa aqui. Devia voltar prá lá direto.
R: Voltar prá onde?
S: Pro texto que eu tava antes.
R: (Dá um prompt). O que é que você está fazendo?
S: Tô lendo aqui no DEU NO JB (silêncio enquanto lê). (Riso). Voltando lá.
R: Voltando prá onde?
S: Pois é, eu tô voltando e não tá voltando.
R: É?
S: O problema é esse. Deixa eu clicar aqui prá ver se volta. Ah!!! Volta pro menu, mas eu não queria voltar pro menu. Eu tava aqui no, no, na explicação...
R: De quê?
S: De cognatos, então quando eu entrei aqui em estratégias básicas e pistas, acabei de ver pistas, eu queria voltar prá cá, prá ler o cognato, aí tive que voltar pro menu.
R: Ahã.
S: ...enquanto que aqui eu tinha que voltar prá onde eu tava. Então no lugar de PISTAS eu tinha que Ter alguma coisa que voltasse prá aqui. (Em silêncio, lê mais um pouco). Vou clicar em SEMELHANTES. (Em silêncio. Lendo).
R: (Dá um prompt) Agora você tá , então, na tela de Cognatos, Explicação, Palavras Chave.
S: Estratégias...é. .....Ué?
R: Aqui ele tá te explicando, que a palavra *semelhantes*, então, é a chave do significado de ...
S: Volto prá lá, volto prá lá prá ver se dá um exemplo...
R: Será que não deu?
S: Não. Ele volta prá lá.
R: Não pode baixar um pouquinho (scroll a tela). Aqui não tem, não, um exemplo...
S: (Ri). Ah, tá.....Vou ver os exemplos.....
R: (Dá um prompt). E agora?
R: Voltei pro SEMELHANTES prá ver os falsos cognatos.
R: Hã, hã.
S: Tô lendo os falsos cognatos.....Eu nunca confundi SENSÍVEL com SENSATO.

R: É?
S: Ah, podia ser (faz esse comentário sobre algo que está lendo). Agora eu quero voltar lá prá trás, tem que vir aqui, né?
R: Tá, então tu vais na tela inicial...
S: Voltei no EXEMPLO... EXERCÍCIOS não fiz ainda.... EXEMPLO eu já fiz?
R: exemplos DE FALSOS COGNATOS...sim!
S: Ah, já...SENSÏVEL, não, SENSATO... tá. Ué, voltou prá lá. (Lê em voz alta parte do enunciado): As stratégias de... faça um scanning do texto abaixo e digite três cognatos que você encontrar. (Repete) Faça um scanning...
R: É, dá uma geral aí...
S: Esse é um termo em inglês, né?
R: É. É um termo técnico da nossa área de instrumental.
S: Ah, de instrumental.
R: O skimming é só uma olhada rápida e o scanning é uma... como quando passa o scanner...(Retomando): Então você tá na página de EXERCÏCIOS de cognatos.
S: ë, mas devia usar termos em português: Faça uma leitura rápida do texto abaixo.
R: (Riso) É!!! Vou falar com o deputado prá dizer que já tem alguém que vai assinar lá..
S: É... assinar (Risos). BREWING, não sei o que quer dizer...
R: Não faz mal porque você não tá procurando não é cognato?
S: Por isso é que eu tô lendo o resto. (Fica em silêncio lendo). Ah, aqui éprá procurar cognato, né, e citar... quantos que era mesmo? (Lê o enunciado): ..."três cognatos que você encontrar". (Fica em silêncio procurando).
R: (Dá um prompt): Já encontraste alguma coisa?
S: Tem MODERNISING e ...
R: Então, digita lá...
S: (Murmura alguma coisa)
R: Mas eu acho que não vai dar, aqui pelo meu... (Risos de ambos).
S: Ah, devia poder... (Risos)
R: Devia mesmo... Eu nem sei se vai digitar... Vai digitando, depois é que vais aparecer. Acho que está com um defeitinho aqui...
S: Ah...
R: Na primeira vez que eu fiz, apareceu logo, mas depois...não apareceu mais.
S: Vê se fazendo assim, aparece?...Não (ele tenta clicar tecla 'control' + qualquer coisa).
R: Depois que você descer/subir ele aparece. (Sujeito vai digitando). Põe o outro... (S digita)
S: 'Controlling', 'rapidly'... Tem um monte, né?
R: Tem. Foi de propósito mesmo.
R: Mas nenhum deles apareceu...Será... Corrigir, não, né?
R: Vai, vai ver!
S: Aqui é corrigir. (Dá errado).
R: Ôpa. Ah, é porque...quando tu... quando tu puseste o sinalzinho ali, escreveu... e como você escreveu de novo... OK, fecha lá e volta.
S: AH!!!
R: Agora apareceu! Apaga um e deixa o outro.
S: Viu como aparece? Apagou tudo, será?
R: Agora já não sei (Risos) (Sujeito volta a corrigir. Dá errado novamente).
S: MODERNISING, não. Então prá apagar...
R: ...mas aí vai ficar errado aí...
S: ...apaga tudo...Gozado. Vamos ver (corrige) . Não é um cognato. Apagou tudo, então vamo lá. Vamo ver se dá certo: Control B (inaudível) Control B que eu queria... tá, agora vamo corrigir. (Dá errado novamente). É que eu fiz duas vezes. Escreveu duas vezes, você viu? Então vamo lá, apaga tudo de novo
R: (Risos) É usa o método simples.
S: Mas é assim que a gente trabalha... Acho que agora taqui.... Tá um só. (Tenta novamente e corrige). (Dá errado de novo). Não. Vamo escrever ele aqui. Eh, perdi, como escreve lá o MODERNISING... Onde é que eu parei? (Digita). Não vai dar certo... Quando a gente não...

R: É que tinha que tá aparecendo, entendeu. : É, alguma coisa que não tá... Isso o rapaz vai ter que arrumar prá mim...
S: É...porque aí você não consegue ver se errou, se não errou...(Ele corrige novamente e dá errado)
R: É, alguma coisa que não tá funcionando... (Sujeito corrige e dá errado). MODERNISING...
S: Dois Ns. Então, quando você vai corrigir... (modifica o spelling)
R: Não, tu apagaste foi o G. (Corrige e dá certo).
S: EH!!! OH, demorou, heim? (Risos). E agora, como é que eu vou prá outra janela?
R: Não sei.
S: Vou tentar aqui. Não. (Lê alto o título do Let's have fun): DEU NO JB. Menu
R: Vai pro menu de novo...
S: Vou ver se acerto. (Lê): COGNATOS...Let's have some fun... Let's have... alguma graça?
R: É...vamo brincar um pouquinho...
S: Ah, tá. Não, essa aqui eu já vi!
R: Hã, hã. (Dá um prompt): Então, o que você vai fazer?
S: Agora vou voltar prá PALAVRA-CHAVE. (Lê alto): Primeiras estratégias, palavras-chave, explicação (fica lendo em silêncio). Tá, se clicar aqui não volta prá lugar nenhum. Se eu vier aqui...Ué, voltou a mesma coisa, mesma tela.
R: Porque você tinha voltado...
S: Ah, agora voltou...Tá...Então vambora prá frente... (Lê alto): ESTRATËGIAS... O que é isso aqui? (começa a examinar a barra de ícones)
R: Se você não quiser SOM
S: Vamo de novo prá PALAVRAS-CHAVE, EXEMPLOS de palavras-chave. (Lê alto): Primeiras estratégias, exemplos de palavras-chave. (dá um scroll) Descer aqui, prá ler direito. (Fica em silêncio)... ENTREPRENEURIAL? nunca vi essa palavra '-NEURIAL' . ...SUCCESS...
R: 'entrepreneurial' não é palavra-chave, mas 'success' é. Ah... ah, não, tá certo, desculpe. Todos dois são palavras –chave. Tô confundindo com cognatos. Tá certo, 'entrepreneurial' é um empreendedor.
S: Pois é, mas nunca vi com essa terminação '–rial'
R: Bom, então são exemplos de...
S: (em silêncio). E agora? Agora volto prá cá. Não, vou prá frente. Há, há, deixa estar... E agora? (Lê alto): Ah, tá: Tarefa 1, Tarefa 2. Ah, tarefa 1 taqui. (Lê alto o enunciado): DIGITE TRÊS PALAVRAS QUE VOCÊ CONSIDERA CHAVE NA SUA ÁREA DE ATUAÇÃO. Inglês ou Português?
R: Português. É um exercício aberto. Cada um que vem aqui, digita na sua própria área.
S: (Digita alguma coisa e comenta): Essa palavra tem uma complicação danada: ??? 'otimização' Não existe no dicionário. 'Otimização'. Então, a dúvida é se fica com dois 'c', com 's', com 'z'...
R: com 'z', com certeza, não tenha dúvida.
S: Com 'z'. 'Otimização', 'sistemas' ...e agora?
R: Outra palavra da tua área...
S: Milhões, né?
R: Escolhe uma!
S: 'gerenciamento'
R: Exercício aberto, esse aí, tá?
S: Não, vai prá (?????????). (Lê alto): Tarefa 2: Faça ...Então, no caso de tarefa 1, devia tá aqui 'fim', né, alguma coisa que você pulasse prá tarefa 2. Porque como é que você ...Tinha que ter um ... coisinha de.. 'próxima'
R: Hã, hã. Ê mas se disser que é 'fim' a pessoa pode achar que é 'fim', 'fim' de tudo.
S: ...não (???) 'próxima', próxima tarefa'.
R: Mas se você voltar, você vai verificar que tem lá "links para tarefas 2 e 3'
S: Aí, quando você vem prá... prá...aí quando você já tá na Segunda, aí, sim, tarefa 2, tarefa 3. Mas na primeira, por exemplo, você ficou aqui...aí tem que adivinhar que tem que vir prá cá, né?
R: Tá.
S: (Lê alto o enunciado): 'Faça a correspondência entre os títulos abaixo e os extratos que aprecem nos quadros'. Vamos ver os quadros... 'usando as palavras-chave como pistas.' (Fica em silêncio, lendo os extratos).
R: (Dá um prompt): Agora você tá lendo...

S: Tô lendo os textos
R: Tá.
S: Tô lendo os textos que estão lá embaixo.....Tem mais (Scroll), deixa eu ver se tem mais. Correspondência 1A, 2B, 3C. Ah, aparecem (lê o enunciado novamente) 'faça a correspondência dos extratos com os títulos que aparecem'. (Lê partes dos extratos em voz alta). 'B'. 'E 1 com 'B'. Só pode ser esse porque não tem mais 1 com 'C'.
R: Tem.
S: ...1 com 'D'. Mas o único que tem 1 com 'B' é esse. É o único que tem 1 com 'B'. Se tivesse outro 1 com 'B'...
R: Tinha que ter outro com...
S: ...um outro com 'B'porque aqui não dá... A gente adivinha porque é o único com 'B'. Como eu tenho certeza que aquele é o 'B'...
R: Então corrige lá...
S: Xô ver aqui... (Lê frase de outro extrato)... Aqui é 2... com 'D'...Tá certo. E o 3...(lê frase do extrato) (murmura coisas enquanto raciocina), é o... é o... o 3 é o 'A' 'E esse aqui mesmo.
R: Mas bem que você ficou em dúvida se não era o outro, né?
S: ë, mas como tava falando sobre ações, né, e eu tava em dúvida sobre o que quer dizer 'drifts' ... 'up' é 'subir', né? Em que 'ações' e eu já confundi 'ações' com falsos cognatos, então pensei que se tivesse alguma coisa aqui de Tóquio eu ia ficar realmente em dúvida se era aqui ou se era aqui. Por isso que eu...
R: Tá. (Pulei a parte gravada com exercícos que já foram retirados na nova versão)
A', tu decidiste ir prá onde? Continuar?
S: Fui prá frente, não era pá ir pra frente?
R: Não, só tô perguntando.
S: Murmura o texto.
R: (Explica o seção) Aqui, essa seção... toda vida que termina uma seçãozinha, eu tenho uma LET"S HAVE SOME FUN, o fecho da... do pedacinho.
S: (Lê alto): 'Pants' calças
R: Hum, hum.
S: (Fica lendo em silêncio)
R: A 'pair of docks' lembra o quê em português? 'pair of docks'(Leio mais rápido). Não lembra nada? É a mesma palavra em inglês e em português. 'pair of docks' (leio mais rápido).
S: 'Paradoxo'
(Risos)
R: ë uma explicação...
S: Agora que você leu alto é que...
R: Exatamente. (Risos) , tem que ler alto.'
S: É por causa disso que se chama 'um par de calças'?
R: Não, é brincadeira! O cara tá brincando, inventando uma explicação
S: Não, mas 'calças' é sempre...
R:É 'pair' (etc.)
S: Agora tô lendo ESTRATËGIAS, CONHECIMENTO PRËVIO. Não tô voltando mais prá... por sei que é a continuação...
R: OK (fecha).

Subject E

Sujeito: (entra na tela de abertura) Tá, eu já começo a mexer aqui? É...ai, meu Deus (ri)...tá, clicar aqui...
R: (Dando um prompt): Você clicou na...no menu, né?
S: Hã, hã, acho que é... é. Tá, eu vou ver o resto agora (explora a barra superior onde estão os ícones do aplicativo. Clica aleatoriamente e dá tela de abertura)...tá...

R: (Dando um prompt) Você fez um...deu uma geral aí nos botõezinhos prá ver o que eles estavam fazendo...
S: É...
R: OK . (Dando um prompt)Voltou prá menu inicial. Página inicial. E agora o que você está fazendo?
S: Agora tô dando uma lida aqui prá vê onde é que eu vou...(Lê o menu): Primeiras estratégias... (examina em silêncio)
R: (dando um prompt) E agora, você tá fazendo o quê?
S: Agora tô lendo aqui...Primeiras estratégias...agora vou voltar prá lá...
R:Vai pro Inicial de novo...
S: Inicial de novo...(silêncio)...Conhecimento prévio...tô olhando tudo aqui,(ri) não sei o que que é...!
R: Cognatos, explicação, né...
S: Hum, hum. Ai, tô meio perdida aqui. Agora voltei prá menu...
R: Voltou prá página inicial...
S: ...página inicial. Não dá prá ficar aqui? Não tem outra página?
R: Você que sabe! Se quer fazer, se quer ficar aí ou quer ir prá outra página!
S: Não, mas tem como ir? Xô vê...
R: (Dando um prompt): Você clicou em Primeiras estratégias, Conhecimento prévio, Let's have some fun.
S: Hum..Aí, voltei prá página inicial...Bom, deve ter um 2 aqui, né...
R: Ah, clicou novamente...
S: ...de novo em primeiras estratégias! (silêncio enquanto examina) Agora eu fui nas palavras-chave...Quero voltar prá página inicial de novo...Tá, eu já vi tudo, assim mais ou menos...
R: Já viu tudo? (Rimos) Então fecha! (Rimos)
S: Fechar tudo...
R: Não, não sei...
S: Ah...
R:...se você disse que já viu tudo, então...
S: Não...não sei, porque tô tentando procurar mais alguma coisa prá ver assim...Isso aí eu já vi, dei uma lida geral...só não vi os exemplos...hum, vou fazer os exercícios (de cognatos). Pode fazer?
R: O que você quiser! (Rimos). Você sabe o que é 'scanning' né? É uma leitura rápida...
S: Ah...
R:...para resolver o que se pede ali, né.
S: Ai, eu vou ler de novo, porque eu não gravei. (Volta para a tela de explicação) "Explicação"...
R: Então você voltou prá...
S: Voltei prá página inicial...
R: Explicação de cognatos, prá ler sobre os cognatos.
S: Isso. (Silêncio enquanto lê) .Agora eu vou voltar pro exercício...Não, vou pro exemplo primeiro...
R: Você veio prá página inicial de novo e agora vai pros exemplos...de cognatos. OK
S: É...Isso. (Em silêncio enquanto lê). Tá agora voltei prá página inicial e vou fazer os exercícios. (Longo silêncio enquanto lê). Ui...dificinho (Ri). (Longo silêncio)
R: Você tá lendo o texto, né?
S: Umhum, tô lendo o texto. (Silêncio). Nossa, só achei um aqui...cognato. (Digita)
R: (Dando um prompt): Agora você tá digitando...
S: ...digitando o cognato do texto. (Longo silêncio). E agora, se não achar mais, o que que eu faço. Xô vê...acho que eu volto prá ver alguns exemplos...prá ver se eu acho aqui...
R: (Dando um prompt): Então, você clicou na tela inicial...
S: É...
R: e depois clicou em exemplos, não é?
S: ...e fui pros exemplos de novo...(Silêncio). Não tem muito. Desisti de fazer o exercício (Ri).
R: É, voltou prá página inicial e desistiu de fazer o exercício...
S: É. (Ri).
R: ...de cognatos. Agora você vai prá...
S: Agora eu vou ver... de novo 'Explicação de palavras-chave'.

R: OK.
S: (Silêncio). Tá, agora eu vou voltar prá página inicial e ver alguns exemplos de palavras-chaves ...(silêncio) Tá, agora eu vou voltar prá página inicial, o Exercício. Agora eu vou fazer o exercício aqui...Hum (Digita).
R: (Dando um prompt) Tá digitando, então, palavras-chave da tua área, né? OK
S:...palavras-chaves...Isso. (Vai digitando). Agora eu vou voltar prá página inicial...vou ver explicação de conhecimento prévio...(Silêncio enquanto lê). Apertei prá ver uma dica, aqui...(Silêncio enquanto lê). Agora eu vou ver exemplos de conhecimento prévio, sem voltar prá página inicial (Ri)...porque eu descobri agora bem aqui...(Ri) (ela descobriu o ícone na barra superior com indicações de navegação).
R: Hum, great. (Rimos). Sem voltar prá página inicial!
S: (Silêncio)
R: (Dando um prompt): Então você está no exemplo 1 de...conhecimento prévio.
S: Isso. (Silêncio enquanto lê). Agora vou pro exemplo 2. (Silêncio enquanto lê).
R: Agora você clicou na ...
S: ...na Dica do exemplo 2. (Silêncio enquanto lê). Agora eu vou fazer o 3 (Silêncio enquanto lê).....Agora eu vou ver a Dica do exemplo 3. Eu vou ver 'Exercícios'.
R: (Dando um prompt): Task one do Conhecimento Prévio...dos exercícios.
S: É, isso. (Longo silêncio enquanto lê). (Digita). Tem que falar isso também?
R: Tem, é...
S: ...Ah, tá.
R: Você escolheu a palavra, né...
S: ...é...
R: OK...
S: Daí, é... prá fazer o exercício...Colei... antes...faltou...acho que é muito grande (digita novamente) . Tá, agora eu vou corrigir o exercício...Hum...Tá, eu vou pro exercício...task 2..
R: Tá, você conferiu e agora tá indo pra Task 2, Conhecimento Prévio. All right.
S: Hã, Hã. (Silêncio enquanto lê). Agora fui na Dica do Task 2... (Silêncio enquanto lê). Agora vou pro Task 3 (Ri)...porque...
R: OK! (Risos) ...você não quer fazer a 2!
S: Não!!!(Ri)
R: Não tem problema. OK.
S: (Longo silêncio enquanto lê e vai tentando achar as palavras corretas).Agora tô vendo a Dica do Task 3. (Silêncio enquanto lê). (Volta para o exercício 3 e continua a procurar as palavras corretas) (Longo silêncio) . Acho que não pode repetir, né, vou deixar assim porque...
R: É... uma prá cada.
S: ...melhor deixar assim porque não tenho certeza.
R: (Corrige). Mais acertos do que erros! (O som está desativado).
S: Os acertos são os verdes, né? Ah, tá. Silêncio). Isso aqui é...um acerto, tá em vermelho, ó. Ah, tá, tá, isso aqui é uma cópia do meu... Deixa eu fazer, vê se eu acerto agora...Agora eu vou corrigir...tentar corrigir o que eu fiz de errado...(Silêncio). Três... tem que trocar as três...(vai digitando e tentando) Tá, corrigir de novo, vai corrigir e ver o resultado de novo. Errei de novo (Ri). (Novo silêncio, tenta acertar). A gente vê os erros e fica mais fácil. Agora que eu peguei o ...sentido do texto aqui. Ãhan... Agora eu vou corrigir de novo...vê se eu acerrtei... (acerta) Agora deu.
R: Olha...!
S: (Ri). Agora deu. É bom porque aqui tu vê quando...só sobrou algumas palavras que eu errei, né, tem que encaixar...Daí agora eu peguei assim, direitinho...
R: Mas você sentiu que acertou mais que errou, né?
S: É, Hã, hã. Agora eu vou fazer task quatro.
R: ...(Dando um prompt): ...do conhecimento prévio...
S: ...do conhecimento prévio. Meu Deus. (Longo silêncio enquanto lê).
R: (Dando um prompt). Agora você tá fazendo o quê? Só dando uma olhada...?
S: É, tô tentando entender, porque (Ri)...ainda não entendi que língua é essa aqui. Acho que só pode ser uma resposta aqui, né?
R: Sim.

S: (Longo silêncio) Tá, eu escolhi uma opção, daí eu corrigi e deu errado. Outro. (Silêncio). Bom, pela... o que tá escrito ali não entendi nada, tô tentando identificar mais pelo nome dos países aqui e fazer alguma relação com alguma coisa...
R: Porquê?
S: Porque... É que aqui terias mais aqui em baixo seriam os países que seriam mais desenvolvidos...daí eu não tinha olhado direitinho o nome dos países...(Digita). Hummm (Ri). É que a gente...eu não tenho idéia nenhuma... Sei lá...
R: É que você não está utilizando...
S: Os cogn...OK as palavras-chave (Ri). Pois é...Vou ver de novo os cognatos, então (Clica na explicação de cognatos). Explicação de cognatos.
R: (Dando um prompt) Clicou na explicacão de cognatos. Right. Você já tinha estudado sobre cognatos, não é?
S: Acho que sim, não lembro, assim...já, já, já, tô me lembrando. Ah, tá eu tava tentando identificar...mas... agora eu vou voltar prá página que eu tava...ih...não vai. Então eu tava...
S &R: ...conhecimento prévio, né?
S: ...então eu vou voltar prá página inicial... taqui...exercícos de conhecimento prévio...tarefa...task 4. Uhmmm, agora achei outra 'labor'. (Clica na opção) . Acerta. (Ri) . Som está ativado pela primeira vez). É que eu tinha clicado lá no início....(Rimos)na...
R: Por que você marcou, por causa do 'labor'?
S: ...do 'labor'.
R: Ah, agora você viu...aonde você viu...?
S: Agora eu vi...Aqui...
R: Ah...
S: Aqui também tinha, é que juntou com outra daí não me liguei, tava no início...Vou ver Let's have some fun, Conhecimento Prévio. (Silêncio enquanto inicia a leitura e logo em seguida: Não, desisti. Eu pensei que tinha visto (?????). Eu gostei de fazer os exercícios! (Rimos).
R: Não, tudo bem.
S: Vamo prá página inicial de novo. Acho que já fiz tudo. Agora vou pros exercícos dos cognatos. Aqui só tem um. Ah tá.
R: Será que só tem um?
S: Só tem um...não sei...é que nos outros deram.. Agora eu vou fazer porque antes eu não tinha há corrigido esse aqui e quero ver a resposta. (Silêncio).Vou ver de novo a explicação de cognatos. Acho que a primeira vez que eu tinha feito tava com uma idéia errada.
R: Tava com quê?
S: ...uma idéia errada de cognato. Comecei a fazer antes...que eu tinha desistido..porque eu não tinha achado uma palavra e achei estranho. Hum hum. Tá, eu vou voltar prá exercício de Cognatos (Digita).
R: (Dando um prompt): E agora você está digitando as respostas, não é?
S:...é, a resposta. Isso. (Vai digitando).(Corrige e acerta. Ri). Corirgi, né. Agora vou voltar prá página inicial...não é aqui...é aqui...ver se ...o exercício das palavras-chave, se eu fiz. Só tem um...tem dois (Longo silêncio). Agora tô respondendo... Vou ver se tá certo. (Acerta. Ri). Daí eu vou voltar prá página...Não vou ver Let's have some fun...(Silêncio enquanto lê). Daí vou prá página inicial... Vou ver Let's have some fun do conhecimento prévio...não eu já tinha isso aqui...(Silêncio). Acho ruim ler em computador porque eu tenho...não sei...eu tenho necessidade de ...o que eu não entendo, eu sublinho e assim ...tu lendo...daí tem palavras que eu não sei, eu passo, eu não consig...daí não dá prá voltar, sabe, eu não marco aquela, daí eu acho mais difícil prá mim assim.
R: Hã, Hã.
S: Voltei prá página inicial...Acho que eu já vi tudo!
R: OK. Thank you.

Subject F

Página de abertura

Sujeito: Então eu tô aqui...preciso ir prá próxima tela, né...(Lê) Primeiras Estratégias...(silêncio)
Researcher: (Dando um prompt): Agora, o que você está fazendo?
S: Tô lendo a parte inicial que, que o título é Primeiras Estratégias. Tá, o texto tá explicando o que é a leitura (silêncio), daí nessa parte o texto dá umas dicas de...como escrever, observando as palavras repetidas, o lay out. Daí cada uma tem uma explicação a mais...isso deve acontecer em todas elas...e daí explica também a respeito de cognatos ...
R: Você voltou prá...
S: ... palavras-chaves.....agora eu tô voltando da última...arquivo, agora eu (inaudível)
R: Mas não foi, né?
S: Vou voltar...então...não acho que isso não exibe mais.
R: É?
S: Então, palavras-chave, explicação. Então tô lendo agora a respeito de palavras-chaves que tá falando mais ou menos que é uma referência à área do texto...tá...então voltei e...agora acho que dá prá entrar na próxima página, só que a próxima...só que tô voltando aqui prá pegar...pegar do início...
R: ...da página inicial, né?
S: Então eu tô entrando em cognatos, explicação, que parece ser quase a mesma coisa do que eu tava lendo...e aqui explica o que é os cognatos, dá alguns exemplos...daí clicando em semelhantes (link), envolvendo semelhantes, explica um pouco mais falando de verdadeiros cognatos e falsos cognatos, então os verdadeiros cognatos...tem um outro link...mas eu posso voltar prá ver o que ele fala a respeito de falsos cognatos. (Silêncio enquanto lê).
R: (Dando um prompt): Agora você tá lendo sobre falsos cognatos, né?
S: Isso. Então depois disso dá prá voltar prá página de início e pegar a próxima linha que são os exemplos, tá, que era mais ou menos o que eu...que eu tinha lido. Tá, então fala de novo de cognatos verdadeiros e falsos. Então dá prá voltar e ir pro próximo item que é o item de exercícios. Então agora tô lendo...peguei um texto que parece que dá a introdução do exercício e pede prá digitar três cognatos que se encontram no texto (MAS ELE NÃO FAZ!). Bom aqui eu vou voltar, então, ver o próximo, que é tipo um exercício de diversão, curiosidade, então eu tô tentando entender agora o que o texto tá falando...tá ele tá falando de um processo nos Estados Unidos de um surfista que foi mordido na perna por um cachorro, só que daí o que dá prá perceber é que o cara não sabia falar muito bem aí ele falou como ele devia falar aquilo em português. Bom e depois tem as palavras-chaves que é mais ou menos a mesma coisa que tinha antes...aí o exemplo e explicando o que qui é. Então o exercício de palavras-chaves, tá prá digitar as palavras que você considera importantes na área de atuação e depois de novo tem a parte de...o texto de diversão que fala um pouco das...expressões comuns. (Silêncio). Bom, não...não entendi muito bem o texto...Então conhecimento prévio tem a mesma coisa...explicação...fala mais ou menos... então vamo ler prá vê o que fala...é a respeito da leitura como processo interativo, falando do bom leitor, da transmissão de informação, da compreensão, uso de estratégias prá criar, recuperar, procurar significados. Tá fala do processo de ler e entender, não apenas de usar o que tá escrito no texto e...na última parte ele fala como se fosse o trabalho de um detetive que busca pistas, indícios, detalhes prá entender o significado correto tirando o máximo de incerteza. Então, voltando, tem de novo os exemplos de conhecimento prévio, com um pequeno texto que fala de pessoas de nacionalidades diferentes e...é uma situação de pessoas num restaurante e...daí o garçom fala com eles ...e daí cada um conclui que não entendeu nada... do que o garçom falou porque cada um queria saber de uma parte diferente do que ele tinha dito. Bom, depois tem exercícios também e o exercício é....tipo...Ah, tem que ler o texto e ver qual é a área em que o texto é aplicável, se econômica, política, acadêmica ou médica (TASK 1 de Conhecimento Prévio) e depois tem de identificar as palavras-chaves. E também aqui tem a parte do texto de diversão...e no final...debaixo do texto tem um PS que diz que...tá falando a respeito do programa com o uso de estratégias de

leitura: os cognatos, palavras-chave, conhecimento prévio e tá falando também que a análise do contexto também pode ajudar a diminuir o grau de incerteza, reduzindo o número de possíveis alternativas do significado de uma palavra desconhecida. Bom , o texto .....o texto, tô lendo meio rápido mas não dá prá entender tudo, mas tem umas partes que ele fala em inglês bem confuso.....tá, então, eu acho que é isso. Daí o que tem prá fazer são exercícios que daí eu vi todos eles mas não fiz nenhum porque primeiro eu peguei uma idéia geral do que ..tudo o que tava sendo colocado...daí agora eu não sei...
R: OK, se você quer parar, tudo bem...
S: Mas isso não vai te...
R: Não, tudo bem, tudo o que for feito, prá mim tudo bem.
S: OK!?.

Subject G

Tela de abertura

S: Já começou? É só entrar em algum lugar?
R: Não sei, você que sabe! Você já está fazendo o meu experimento!
S: Clicar no primeiro ícone. (Lê) Primeiras estratégias (Vai murmurando enquanto lê. Silêncio). O primeiro item é explicação...
R: ...de cognatos, né? Tá.
S: (Em silêncio enquanto lê). OK .
R: (Dando um prompt): Voltou prá tela inicial...clicou nos exemplos (Rimos). Tá vendo os falsos cognatos, né? Você já tinha estudado sobre cognatos, essas coisas?
S: Não.
R: Beleza, melhor ainda! (Rimos)
S: Bem, um pouco. Já tinha...já tinha...sensible- sensível...(Inaudível). Bom, vamo voltar...vamo pros exercícios.
R: (Dando um prompt). Você voltou prá tela inicial e depois clicou nos exercícios de cognatos.
S: Isso. (Sujeito lê murmurando baixinho)
R: Sabes o que que é 'scanning', né? Só uma geral, assim...
S: (Ainda em silêncio).
R: Então você leu...
S: Olha, olhei bem rápido e tô tentando traduzir muito, mas não consegui achar nenhum. Bom...vamo Ter alguma diversão aqui. (Vai para o Let's have some fun). Ri um pouco. Tá. Meio sem graça, vamo voltar. Vamo voltar prá tela inicial, palavras-chave, explicação...Vou voltar prá tela principal e entrar nuns...exerc..., não, nuns exemplos primeiro. (Fica em silêncio). Vou voltar e vou fazer um exercício, então (Task 1 dos Cognatos). (Lê em silêncio). Eu digito em inglês?
R: Do jeito que você quiser.
S: (Vai digitando). Esse aqui (o teclado) é um pouquinho diferente prá mim.
R: Acho que é aqui e depois o c (ele queria digitar o ç).
S: É. (Continua digitando).
R: Esse não tem validação, não. Cada pessoa que chega tem de uma área diferente.
S: Hum. Bom, não tem nada prá confirmar, eu vou voltar...prá página principal (menu).
R: (Dando um prompt). Aí você foi prás palavras-chave no 'fun'.
S: É.
R: Você não achou engraçado. Diz essa expressão bem depressa.
S: Pais of docks.
R: Mais depressa...
S: Pair of docks...
Pairofdocks, pairofdocks...OK Paradox. Não te lembra mais nada, outra palavra...
S: Paradox.

R: Yeah! Que é o "internal contradiction" uma crazy etymology e também um jogo de palavras...que também não é engraçado(Rimos). Right!. Aí você foi prá tela inicial...
S: Hum... Eu fui prá tela inicial e vou ver o conhecimento prévio, a explicação.
R: Right.
S: (Lê em silêncio) Bom, vou clicar prá ver a dica...Vou voltar prá tela principal e vou ver...alguma diversão.
R:.. Fun do conhecimento prévio.
S: (Lê em silêncio). Ri. Esse foi é mais divertido!
R:... tá melhorando, tá melhorando, né? !!! (Rimos)
S: Vou prá tela principal e....bom, acabou. Agora...vamo ver...Isso aqui me chamou a atenção no ...(fala da barra superior com os ícones). Liga o som, o correio...
R: É ...que o aluno pode mandar pro colega, pedindo uma explicação...
S: Ah...
R: ...tipo, fizeste o exercício tal? não entendi nada o que que é. Aí o cara te responde, ou o professor acessa prá ver se tu fizeste as tarefas, entendeu?
S: Tá. Então eu vou prás estratégias...
R: (Dando um prompt): tás nas primeiras estratégias de novo.
S: isso. Ah, tá, são todos aqueles itens...(ele está observando a lista de pistas da tela Primeiras estratégias) agora se eu quiser voltar prá tela eu volto, se eu quiser passar prá outro item eu passo prá frente...Tá. Bom, então, na verdade, eu já vi tudo, né? Cognatos...Começou cognatos...
R: É, você começou a clicar 'cognatos', agora voltou prá primeiras estratégias de novo...
S: (Em silêncio).Bom, agora...eu volto. Tela inicial. Aí eu volto à tela inicial agora. Bom, por enquanto é isso.
R: OK.

Subject H

Tela de abertura

R: Não esquece de dizer o que você fez. Você clicou na página...no menu, né?
S: Cliquei no menu. (Silêncio).
R: (Dando um prompt): O que é que você tá fazendo?
S: Tô lendo...
R:...lendo todos, né?
S: Hum, hum. Vou clicar no cognatos, explicação.
R: Você já tinha estudado cognatos antes?
S: Já.
R: Já, né.
S: (Longo silêncio enquanto lê). Vou clicar nas estratégias básicas (primeiro link, que manda prá tela anterior). (Silêncio enquanto lê. Clica em cada ícone prá ver o que tem lá: palavras repetidas, layout, etc.). Vou clicar em cognatos novamente. Clicar agora em 'pistas' (outro link que leva prá mesma tela anterior com a lista das pistas). Clicar agora em 'palavras chave'.
R: Clicou na tela de palavras-chave. Tá lendo 'explicação'.
S: Tô lendo explicação. Agora eu vou voltar... (volta prá tela imediatamente anterior)
R:...que é o 'fun' dos cognatos, né.
S: (Lê em silêncio) (Não faz qualquer comentário ou demonstra qualquer reação). Que é isso? Menu? Voltando pro menu. (E vai pro) Exercícios de cognatos. (Lê em silêncio).. falar?
R: ...Bem, bom...Então tu vais agora digitar os cognatos.
S: ...digitar os cognatos do texto. (Digita em silêncio. Corrige. Acerta). Tem que corrigir, né?
R: Se quiser. Se não quiser, também...
S: Ah, tá.
R: (Dando um prompt): Então tu corrigiste, né, ...
S: Hum, huu.
R: ...right, e agora...

S: ...voltar pro menu. Entrar no 'palavras-chaves', exercícios. (Digita)
R: Você tá digitando as palavras-chave da tua área, né. (Leio o que ele escreveu): Ah, você é bem da área mesmo, né? (Ele é aluno de economia, acho). (Rio). (Continua digitando). Não tem validação porque cada pessoa que vem aqui tem uma área diferente.
S:É Daí, o que que eu ponho?
R: Nada. Você tá voltando...prá palavras-chave...
S: ...voltar pro menu. Eu cliquei aqui em; 'Let's have some fun'...
R:...de palavras-chave, né? OK.
S: (Ele lê em silêncio).
R: Você voltou pro...
S: ...voltei pro menu. Eu vou clicar em 'Conhecimento Prévio' 'explicação'. (Silêncio enquanto lê). Clicar em 'Estratégias'. Vou voltar pro menu...Clicar em 'exercícios de conhecimento prévio'.(Longo silêncio enquanto lê). (Digita).
R: (Dando um prompt) Você está respondendo agora...
S:...tô respondendo a questão. (Verifica se acertou. Acertou). (Faz a segunda parte do exercício: digita. Verifica se acertou. Errou.)
R: OK, só a primeira que não deu. Acho que é porque é um termo muito amplo, né. (Ele não procura outra resposta)
S: Voltei pro menu...e vou entrar em 'Let's have some fun' do Conhecimento Prévio. (Silêncio enquanto lê. Sorri e continua a ler. Sem mais nenhuma demonstração...). Voltei pro menu...o que é isso? ('Descobre' a barra superior de ícones).
R: Isso aí é que a gente tá fazendo uma...vai ser possível aos alunos que trabalham no projeto, mandar perguntas pro professor, o professor responde, ou pros colegas, entende, vai criar um grupo interno de trabalho...
S: Cliquei em 'cognatos' , exemplos. (Silêncio enquanto lê). Voltei pro menu. Palavras-chave, exemplos. (Longo silêncio). Voltando pro menu...eu vou clicar em exemplos de 'conhecimento prévio'. Voltei pro menu. Deu.

Subject I

Tela de abertura
Tela de menu

S: E agora, faço o que eu quiser?
R: É com você.
S: Vamos ver o que é que tem aqui... Explicação, exemplos ... exercícios...Que que é 'conhatos'? Palavras-chave, explicação, exemplos, exercícios. Conhecimento prévio, explicação, exemplos, exercícios. Bom, vou começar pelo 'conhecimento prévio'. Explicação. (Começa a ler em voz alta): "A leitura"...ai que letrinha pequena, ai. "A leitura é um processo interativo..." muito texto, pelo amor de Deus! "...que envolve uma série de componentes essenciais. O próprio texto..." ai, não dá nem vontade de ler. (Vai lendo agora em voz alta, mas atropelando as palavras, com muita pressa). (Suspira). Já perdi, pronto. Tô ficando nervosa. (Ri).
R: Não, fica calma.
S: Não, é nervosa não é por causa do teste, é por causa do tamanho da letra e a quantidade de coisa escrita, tá.
R: Ah, tá.
S:... se eu tiver um papel, eu leio, não é. (Continua). ..."Conjunto de estratégias..." Dá prá clicar aqui? (link) não, vamo voltar, vamo terminar aquilo lá (Tela Explicação de Conhecimento Prévio). "...para criar, recuperar e intercambiar significados (lê toda a tela em voz alta)...."o verdadeiro culpado (ops!) significado." Eu diria que é 'culpado' mesmo. (Rio). Clica em Dica (e lê em voz alta, murmura o texto , atropela). Tá, tá. Tudo bem. O que é que tem aqui "Componentes essenciais" (link. Ela clica e vai para a tela Primeiras Estratégias) 'Fonte de informação' _ tá explicando o que é texto!
R: Então você clicou em componentes essenciais, né, que é o link...

S: Tá, tá, então...(lendo em voz alta): "O ato da leitura pode envolver alguma dificuldade no que diz respeito ao vocabulário"... Nossa Senhora, isso aqui é uma coisa tão longe de mim...! ".....ele pode não ser extenso"... já virou tudo automático, nunca parei prá me preocupar com isso... (Vai murmurando o texto que ela clicou nas pistas _ no uso de palavras repetidas). Ah, será que é isso que eu quero? Bom, isso aqui é um texto, "lay out do texto, tipo de fonte, palavras..."tá...prá mim no computador só serve esse treco aí ", gráficos, números", fechar... o que mais tem aqui embaixo..."observando o contexto" não tem nada (isto é, ilustrações ou texto), "observando os 'conhatos' "...palavras-chave...Bom agora, nós já tamo voltando, né, naquilo, no começo...né, Tá...então eu quero voltar...

R: Você voltou prá tela inicial...

S: Foi prá explicação. Voltei prá tela inicial...Agora vamo no exemplo. (Lê em voz alta): "Primeiras Estratégias, conhecimento prévio...Deu no New York Times ...Veja o que você pode inferir da estória abaixo. Um texano, um russo..."Oh, piada?! (Ri) (Continua lendo a estória em voz alta) (Ri). Ótimo! Acho que essa aí eu já ouvi em algum lugar. Tá. Exemplo 1, Exemplo 2...Gostei dos exemplos (Rimos). (Lê o enunciado do exemplo 2 em voz alta) "Exemplo da importância do conhecimento de mundo e da necessidade...(vai murmurando agora)... (em voz alta novamente) ..."in late at a Dublin hotel, and being asked whether she wanted..." a friend... uma amiga, tá..."she wanted anything being delivered to her room next morning, asked for the FT." What's FT? "The clerk desk replied: Sorry...we have Earl Grey Tea and Chinese tea but not FT." (Ela ri muito). OK, not FT. (Continua lendo o desdobramento da explicação e comenta): Sem sombra de dúvidas.

R: (Ela coloca o mouse sobre Dica) Isso aqui é prá ver uma dica...

S: Dica...isso.. (Lê a dica em voz alta)...Não...não...

R: Sabe o que é FT?

S: Não.

R: ...é o Financial Times. Um jornal econômica mais prestigiado da Inglaterra...

S: Ah...

R: ...como é uma mulher, ele entendeu que ela queria um chá chamado FT...agora se fosse um homem...claro que ele não ia pensar que era um chá... o que o cara queria era alguma coisa muito importante...

S: Pelo menos em termos de piada, né?

R: É...(Rimos)

S: Isso aqui é sacanagem, é sacanagem!!! (Vai para o exemplo 3 e lê em voz alta): "Saddan Hun Sem? Que tipo de conhecimento prévio você deveria ter para"... (murmura atropelando as palavras) (Em voz alta novamente): Estar familiarizado com o nome Saddan Husseim..." Isto eu tô, pelo menos! "Saber que tipo de (E lê tudo em voz alta). Aqui é a dica, né?

R: É a dica de novo.

S: (Lê a dica em voz alta). Só que eu queria saber o resto! Ficou pela metade. Tem mais coisa?

R: Não sei!

S: Não sei, se tem mais coisa aqui...não aparece nada...Não clica nada...Aqui exemplo 2 já foi...não, já foi. Ah, isso aqui já é outra coisa...Exemplos...agora Exercícios.

R: (Rio)

S: O que foi?

R: Não, é que você foi prá tela que eu tava querendo que você fosse!

S: (Ri)

R: A gente fica torcendo, sabe!

S: É!! (Lê) "Exercícios. Primeiras estratégias. Task um. Links para outras tarefas". Tá... Ah esse aqui é do Saddam Husseim, ahhh...ótimo, cheguei lá. Era esse que eu queria mas não tinha nada...(Lê): Indique a área em que..."eu tinha meio que desistido...que bom que eu cheguei lá sem querer...(Lê o texto murmurando) 'ousted' eu não sei o que é 'ousted'. 'Coup'?

R: 'Coup' é golpe de estado.

S: É, 'coup'eu sei. (Continua a ler em voz alta e depois de algum tempo comenta 'tenho que ler tudo de novo). (continua lendo e depois comenta.) : eu entendi o que aconteceu aqui, mas aqui eu ainda não entendi não. (Tenta resolver a questão) "Área onde o texto se insere"...Política, né? Porque é meio-meio, né, tem a estória da política e tem a econômica, que os Estados Unidos não vai dar dinheiro, mas não vai dar dinheiro por causa de quê? Por causa de política! Portanto...(Olha

as outras alternativas e comenta): Nem acadêmica e nem médica, tem dó. (Lê em voz alta a complementação da questão e tenta resolvê-la): Aid... Prime-minister... international aid...elections...power...oh, tem um monte de palavra chave aqui, putzgrila. Pode ser uma expressão, não necessariamente uma palavra só, né? Então... (digita). Deu. (Digita outra: elections). ..And (digita). OK. Links prá outras tarefas. Sou muito sequencial, deu prá notar, é?
R: Não vou tirar nenhuma conclusão ainda!!! (Rimos)
S: (Clica no exercício 3). "Columbus"...!? o detetive... "was powerless against the weather". Que é isso? Ao que ele se refere? Se refere ...
R: A que acontecimento?
S: Columbus...o único que eu conheço é o detetive da TV (Ri).
R: Cada um tem a sua maneira de ver...
S: (Lê a dica em voz alta) . Sim e daí?
R: É um exercício aberto esse. Cada pessoa...
S: E como eu faço aqui? Não tem que escrever alguma coisa?
R: Ou você escreve...ou fala aí...
S: Hum... Então eu vou falar, só, não tô a fim de escrever, não. Bom, a sensação é a seguinte: Columbus, o detetive ótimo, não é, ele é muito poderoso prá descobrir os assassinos, mas em termos de tempo, tá danado porque ele não manda nada. Não é.. Tem um último...Task three...Eu tô na...
R: Tu tás na task one...
S: Aqui tá na task One, fui prá task 2, vou prá task three, tá. (Tudo de conhecimento prévio). (Lê o enunciado em voz alta). O quadro é esse aqui, né? Tá. (Começa a ler o texto em voz alta): "Opportunity in product market is... (Vai tentando ler, entender e marcar a resposta correta do texto).(Quando não conseguiu nenhuma opção) Vamo pensar um pouquinho. Vamo deixar essa prá fazer mais tarde (Continua o exercício tentando marcar as opções). Se eu for corrigir ...não funciona mais agora?
R: Não, se tu queres corrigir, podes corrigir...
S: ...sem clicar aqui...
R: Ah, não, tu queres ler de novo..?
S: ...quero ler de novo prá ver se funcionou. (E começa a ler o texto do início novamente usando as opções escolhidas) OK, tá fazendo sentido. Ganhar vantagem sobre a competição...não, sobre os competidores...is crucial to a success marketing ...plan. (E vai lendo). Tá ótimo. Quer dizer, acho que é.
R: Vamo lê.
S: Continuar, é isso?
R: Vai querer saber se tá certo?
S: Ah, isso aqui é prá corrigir?
R: Queres saber se tá certo?
S: Quero. (E clica no 'corrigir'). Ah...sobre a 'competição' É, talvez, daria mais ou menos a mesma coisa, o sentido é mais ou menos o mesmo. Task four.
R: Então você tá em conhecimento prévio, task four.
S: Isso. (Lê o enunciado em voz alta. Depois...). Ih, não sei o que é cognato. Tem que voltar lá. Então vamos voltar. Como é que eu vou fazer prá voltar...Conhecimento prévio...aqui.
R: Você clicou na página inicial...
S: Isso. Explicação. Cliquei. (Lê em voz alta sobre os cognatos). Tá. Vou voltar prá tela anterior. Uai, não volta prá tela anterior? Volta. 'Pistas' que eu não fui ainda. (Vai lendo atropelado) Não, já falei, não falei? Já vi isso aqui, sim. Não. Ah, já vi, sim. Tô doida. A explicação. Vamo voltar. (Lê em voz alta sobre cognatos). "Cognato é o termo usado"...esse negócio.., eu olhei a coisa..eu sempre esqueço o que vem atrás, eu faço uma bagunça, um pastel. "ë o termo usado para designar a palavra" parará, parará, "pode ocorrer em uma mesma língua ou em línguas diferentes. Aqui, nos interessam particularmente aquelas palavras que são semelhantes no português e no inglês.. Tá. (Lê os exemplos). Tá. (Continua lendo o restante da explicação e comenta): Ai que bom, é bom saber dessas dicas (Continua lendo o texto de explicação). Tä. Mais alguma coisa? Explicação, Exemplos. Exemplos de falsos cognatos. Oh, o tal dos cognatos. Tá. (Lê os exemplos de falsos

cognatos) ... "morose – mal humorado". Ah, interessante. Não sabia. (Continua lendo em voz alta). Clica no link 'cognatos verdadeiros'. Vamos lá. (É levada à tela anterior) : "A semelhança entre palavras pode ser ao mesmo tempo física, isto é, mesma escrita, e de conteúdo: são os verdadeiros cognatos." Então vamos lá, agora fechar, tarará, tarará. Ah, já li isso aqui. ...são semelhantes...então tal, tal tal.. Então tá. Eu tava aqui, não é?. É. Xô vê se é isso. É.
R: Então você tá clicando agora nos cognatos, exemplos.
S: Exercícios, agora.
R: Tá.
S: (Vai para a task 1 dos cognatos) (Lê o título do texto em voz alta): "Change brewing in Brazil coffee industry. (Lê o enunciado em voz alta). Aonde que eu vou escrever aqui, 'coffee'? (Vai lendo o texto em voz alta). Já achei três., né? Você quer que eu leia até o fim?
R: Não.
S: (Vai digitando): 'coffee'. Acho que é isso aqui. 'Coffee' 'café'; 'industry', 'indústria'
R: Você agora está digitando...
S: ...quer dizer, eu não sei se são cognatos, mas a verdade é que... (Clica para corrigir)
R: Você clicou, corrigiu: acertou duas, errou uma.
S: Depois acertei as três...
R:...voltou de novo, corrigiu e acertou as três.
S: ... É. Isso. Bom, não preciso ler, né? Pode continuar? Ah, exemplos...eu tô aqui, aonde? Nos exercícios, né?...acho. Isso. E agora? Já acabei! Só tem um exercício. Vamo...Let's have some fun. (Clica no 'fun' dos cognatos e lê em voz alta). (Ri enquanto lê). Então , acho que aqui já vimos todos.
R: Então você clicou na tela inicial de novo.
S: Tela inicial, que isso aqui terminou. Vamos às palavras chave...tudo isso prá fazer o tal do exercício lá no conhecimento prévio. Tá bom. (Lê a explicação de palavras-chave em voz alta).Tá. Próxima. Exemplos. Aqui, né. "Marketing as a philosophy" Puxa vida, já tem tanta coisa de filosofia na vida. (Lê o texto em voz alta). Ai, vou fazer tudo de novo...essas letrinhas...Não tem jeito de aumentar o tamanho disso aqui, não?
R: Não. Sorry. Isso é só prá mostrar os exemplos...
S: Então, não tem nada que eu precise entender aqui...? Tá. Próxima tela. "Palavras-chave, exercício 1...Cadê..."..na sua área de atuação"!? (Lê parte do enunciado em voz alta e parte atropelado). (Digita): Alimentos...hã, ...(vai digitando)...pronto.
R: Essa é validada por si só.
R: (Vai para a Task 2 e lê o enunciado em voz alta). Ah, tá. Entendi. Ah, tá. Tenho três (títulos) e tenho quatro textos. Tá (Lê os títulos e os textos em voz alta). Aparentemente esse aqui é o três. Bom, (vai lendo alto) Ah, esse aqui parece ser o B. Dois é o D, o 1 é o B e o 3 é o A, não é isso? 1 'e o A , 2é o b e 3 é o D. (Corrige. Dá errado). Não acredito, então não é? 2 é o B...Porque esse aqui não tá lá? Só tem A,B,C?
R: São três títulos...são três...
S: ...pois é, mas aqui tem 4 opções...e eu não tenho qu escolher um...por que que não...sim mas eu tenho que escolher um deles, não é?
R: Você tem três títulos e 4 textos. Um vai sobrar.
S: Pois é vai sobrar e eu não concordo com nenhum deles (Rio). Depois que você escolher esse aqui, esse aqui é o único..., não dá prá saber. (Vai tentando acertar). Então é 1-B. Tem 1-B lá embaixo? Tem. Então vai sobrar aquele, então. 2-D, 2...Ah, é claro, eu tô ficando besta...3...é eu tô ficando louca... 1-B, 2D, 3, ah, tô cega. O único que não tem C aqui...Ah, que burra, que burra...!!! Como é que alguém faria ..não conseguia achar...que coisa!!! Coisa de louco!!! Deu , né? Terminou. Let's have some fun. Eu mereço.
R: Acho que esse não é tão fun...!
S: (Vai lendo partes em voz alta. Murmura). Realmente, não é. Não entendi nada.
R: Lê essa expressão bem depressa.
S: 'Pair of docks' (vai repetindo) (Ri)
R: ..."an internal contradiction... "
S: Ahhh...'paradox'! Entendi. OK. Vamos lá prá primeira, então, agora ver o ... 'Exercício'. Conhecimento Prévio, 2,3, 4. É a task quatro. (Lê o enunciado em voz alta). Tá. "Senlaboreco kreskas'. Sei lá o que que é esse treco. 'January–September', OK, esse aqui é um ...coisa através do

ano, coisa... senlaboruloj ...Europa...Europa eu conheço. Em million, isso aqui é milhão, alguma coisa em milhão, milhões. Espanha, Irlanda, França, ai.....eu não sei se isso aqui é Europa ou Estados Unidos. Itálio, Danlando, sei lá o que que é isso. Alemanha, Grécia, Niderlands, Portugal, Luxemburgo. Tá. Então, aqui tem um monte de estrelinha....'senlaburoj'...parece ser alguma coisa de trabalho...em porcentagem de 'civiluloj'(Ri) 'laborkapabla' (Ri). (Lê as opções em voz alta): O texto é sobre quadro demonstrativo da incidência de doença em países da Europa; Quadro demonstrativo de uma crise econômica em países da União Européia; Demonstrativo de índice de analfabetismo rãn-rãn...Meu Deus. Demonstrativo de índice de desemprego. Acho que é 'desemprego' em países da União Européia. Quadro demonstrativo dos índices de participação da mulher...acho que é esse aqui. Esse 'laboro...não sei o quê..'
deve ser alguma coisa parecido. 'Senlaboreco'(Ri). Pode ser ...laboroj, em milhões...É, pode ser. Deve ser isso mesmo. Espanha...pererê, pererê... Deve ser isso mesmo. Corrigir. Vamos lá. (Acerta). Ah, ótimo. Então, tá. Não precisa mais nada não?
Então, 'Let's have some fun'. (Começa a ler em voz alta e comenta): Esse é engraçado? Se for eu leio, se não eu não leio, não, porque é muito pequenininha a letra...(E continua lendo o texto em voz alta). (Ri ao longo da leitura). (Ri ao final). Ah, essa é ótima! Esse foi ótimo, tá parecendo eu mesmo! Tá. (Lê o Postscript). Ah...Que bom ver isso em teoria porque a gente sabe mas a gente não usa nunca (Ri). Pronto?
R: All right. Yeah.

Subject J

Tela de abertura

S: Próxima tela. Próxima tela, né?
R: Você que decide tudo.
S: Ah, tá.
R: Às vezes baixando aqui um pouquinho dá prá ver o que que é...
S: Ah, tá...Próxima tela. (Inaudível)...volta prá...(inaudível). Próxima tela. Primeiras estrat;egias, cognatos, explicação... Palavras chave, Conhecimento prévio, explicação, exemplos, exercícios, Let's... Explicação.
R: (Dando um prompt). Então, o que é que você fez? Clicou na tela de cognatos, explicação, não é?
S: Sim. (Lê em voz alta). Cognatos, então, seriam palavras semelhantes em portugu6es e em inglês, não é? (Clica no link 'semelhantes' e lê em voz alta.
R: Então, o que você fez? Você clicou...no link 'semelhantes', né?
S: Cliquei em 'falsos cognatos'. Exemplos de falsos cognatos. (Lê em voz alta). (Clica no link 'cognatos verdadeiros' que o leva de volta para a tela anterior).
R: Você clicou em 'cognatos verdadeiros' que te levou de novo para 'explicações'
S: ...para explicações. Eu vou voltar à tela anterior, então. Mais uma vez. Primeiras Estratégias (Lê em voz alta a lista das 'pistas'). (Vai decidindo sobre onde clicar: exercícios de cognatos...não, palavras chave. Clica em palavras chave.) Os exemplos de palavras chaves. "Exemplos de palavras chave. Marketing as a philosophy"(Vai lendo murmurando)...tá. Seriam palavras chaves,, essas...tá...palavras chaves prá entender o texto, né?
R: ...são essenciais prá aquele assunto.
S: ...essenciais. Tendo o conhecimento dessas palavras prá poder entender o texto...Ah, tá.
R: (Dando um prompt). Você voltou prá tela anterior que é a tela de explicação das palavras chave.
S: prá tela anterior..., ah, tá, explicação das palavras chave. (Lê a explicação em voz alta). Sim. (Lê na barra superior do aplicativo): Palavras chave, explicação, exemplos..hum, os exercício. Tá. (Lê o enunciado em voz alta). Seria...em inglês?
R: Tanto faz. Palavras da sua área de atuação...
S: Tanto faz...digite três... Seria inglês mesmo, né, que eu tô estudando, seria 'inglês'...seria...'professor', né, seria o que eu deveria ser...pode ser professor e...aula, aulas é palavra chave também. Tá e aqui...tá...digite...eu já iria prá outra?
R: Tu que sabes!

S: Tá...é que eu não sei direito. Tá, esse é um item. O número 2 também. (Vai para task 2 e lê o enunciado em voz alta). Tá. (Vai lendo murmurando). Tá. Aqui seria...eu teria que achar o título pros três, né?
R: Exatamente.
S: Tá, a 'A' seria a 3, né, "Tokyo drifts"..., pelo menos é o que parece. Deixa eu ler direito (e vai lendo murmurando o texto). Tá. Então...(e murmura o texto novamente). Tá...o 1 seria o B, né, o 3 é o A e o D, não é, né? Tá, só o C, ah, seria o outro, ah, tá taqui embaixo. Não, tá, deixa eu ver direitinho. 3-A, ...ah, tá... agora eu entendi aqui, deixa eu ver direitinho...3 é A, 2 acho que é B...3-A...e 1-B. 3-, 1-B...ah, tá...teria um D também, né? Deixa eu ver (murmura o texto) ..tá, 1-B, 2-D, 3-A, seria, é isso...1B, 2D, 3- A . Aí seria corrigir, né? (Acerta e fica contente). Pô, legal! Deixa eu ler (na barra superior do aplicativo) explicação, exemplos, let's have some fun. Xô vê...Let's have some fun...Primeiras estratégias, palavras chave, let's have some fun. (Lê o título em voz alta. Tá. (Lê o texto murmurando. Aparentemente não entende).
R: Leia a expressão 'pair of docks' bem depressa.
S: 'pair of docks'.
R: mais.
S: 'pair of docks' , pair of dock, 'pair of docks
R: R: paradox?
S: Ah...é, Ah...é..etimologias loucas. Ah, paradox. Ah, agora entendi. Legal, Isso aqui é legal. (ri). Que legal!. Tá, vou voltar, então, prá tela inicial. Explicação, cognatos, exercícios, seria...tá...
R: (Dando um prompt): Você foi voltando tela a tela...
S: ...eu fui voltando tela a tela...
R: ...voltando tela a tela e chegou aí nos cognatos.
S: É. Nos cognatos. (Lê o enunciado da Task 1 – Cognatos). Vou dar uma olhada no texto, né, e procurar cognatos. Tá "Patrocínio"(vai lendo baixinho). Tá, pode ser...deixa eu dar uma olhada só...estratégias, conatos...ah, tá, cognatos, mas não diz se é falso ou verdadeiros cognatos.
R: Scanning você sabe o que é, né?
S: Dar uma olhada só...
R: Isso.
S: Scanning. Isso. 'Modernising' modernisando, né...(e vai digitando e falando as sílabas), tá...Cognatos seriam palavras que lembram o português, né? Seria isso, né? Tá, 'industry' seria, né? Indústria. 'Industry' (digita). Tá. (murmura o texto a procura de outro cognato). Décadas, também, né? 'Decades' (digita). Décadas. Corrigir. (Acerta). Ah, que legal!. Fechar a janela. Tá. Vou voltar agora...aqui são os exemplos de cognatos...voltar à tela anterior... explicação...voltar ainda mais a tela anterior...explicação, primeiras estratégias, tela inicial, tá. Cognatos, palavras chave. Conhecimento prévio. Explicação. (Lê a explicação em voz alta. Lê a dica). Ah, tá. Que legal. Agora...xô vê...É...componentes essenciais (clica nesse link). Então seria as primeiras estratégias (Lê a lista de 'pistas': palavras repetidas, lay out, etc.). Vou entrar em 'observando o uso de palavras repetidas'. (Clica). Exemplos de palavras repetidas. Tá. Teria 'forests', 'plants', 'animals', 'plants', forests'. Seria prá ajudar a entender o texto...as palavras repetidas
R: ...é, quanto mais se repetem mais você sabe que são importantes
S: ...mais você...entende...já vê que ela é importante e ela tem...ela tem a ver com o essencial do texto. 'floresta', 'plantas', 'animais'.
R: É como palavras chave também, lembra? Você vê, ôpa, esse texto aí é de determinada área...
S: Já dá prá ver pela área...nas provas já tô vendo bastante isso assim...Tá. Fechar a janela.. Tá. (Continua a ler a lista de 'pistas'). Voltar prá tela anterior. Tá. Conhecimento prévio, exercícios...vou fazer um exercício do conhecimento prévio. Tá. (Lê o enunciado da Task 1 em voz alta). (Murmura o texto baixinho). (Lê as opções baixinho). Política. (Lê o restante da questão). Tá. Seria 'primeiro ministro', 'second prime minister'(digita). Acho que não cabe. Vou botar primeiro ministro, só, que é mais fácil. Se bem que seria segundo, né..., vou ver se eu acho outra palavra mais fácil. Tá...(digita). Que essa palavra eu nunca vi mas já parece um cognato de 'eleições'. Pelo que se vê no texto, assim, seria 'eleições'. É uma palavra que eu já nem...nunca vi muito bem, mas o que leva a crer pelo texto: Saddan Hussein, primeiro ministro...livres eleições no próximo ano...já tem.....'democracia...seria outra palavra que tem a ver com a política (e digita), tá...'democracy'...meio perdido ainda...Meu Deus...eu não mexo com computador faz tempo já. Vou Ter que fazer um curso...faz muito tempo que eu não...tô sem computador faz muito

tempo...Tá. Eu vou achar só mais uma prá botar no lugar. Seria...o próprio...Husseim mesmo, vou botar Husseim. Tá só trocado, Hun seim, Saddan Husseim. Tá. Corrigir. (Acertou). (Ri). Fechar a janela...(faz a continuação do exercício)... palavras chaves que evidenciam a escolha (marca e corrige. Erra). Tá, vamos tentar de novo. Xô vê. Huu Sem não evidencia a escolha, né, tá. 'Elections' não evidencia a escolha; tá, 'democracy' não evidencia a escolha...

R: É porque o assunto é muito especifico, ele não tá tratando de eleições exatamente, mas da falta de...!!!

S: Ah, tá. Seria...

R: Mas tudo bem...

S: A democracia é a única coisa que tem mais a ver...Ah, tá...hum, hum.

R: Mas tudo bem, não é prá testar conhecimento, não.

S: Não, não, sim, claro...Mas é muito legal isso aqui...muito bom.

Tá. (Vai explorando a barra superior do aplicativo). Ah, aqui desliga o som...a caixa do correio...Tá, volta prá tela inicial, então. (Vai explorando o menu): Palavras chaves...Conhecimento prévio...Deixa vê...palavras chave, né...já fiz o exercício...né...Conhecimento prévio...esse daqui...o que eu fiz agora, já não sei... foi palavra chave...deixa ver se tem exercício de palavra chave...ah, tá, esse aqui é o que eu já fiz antes. Tá, então, voltar, então, prá tela inicial. Cognatos acho que fiz também, deixa eu ver Conhecimento Prévio, ..ah, tá...foi o que eu fiz agora. Tá, exercícios...cognatos...acho que eu fiz os três..já. Fiz os três exercícios...já. Vou voltar prá tela inicial de novo. Tá...palavras chave...Let's have some fun...tá...Primeiras estratégias, palavras chave...loucas etimologias, tá (vai lendo o texto murmurando)...Ah, seria o pair of docks...que eu já tinha visto. Agora que eu vi que seria aquele ali. O mesmo que eu já tinha visto antes, né. Deixa eu dar uma olhada...tá...(vai murmurando , ainda no Fun do conhecimento prévio). Isso já estaria marcado?

R: Não, o Fun é uma estorinha engraçada

S: Ah, uma estorinha engraçada, hummm...teria que achar a palavra... Então, tá..(vai lendo murmurando o fun do conhecimento prévio, mas já traduzindo). (Ri). Tá, Conhecimento prévio, explicação, componentes essenciais, estratégias, tá, conhecimento prévio, explicação, componentes essenciais, ...xô vê pistas. (Vai lendo alto). Ah, tá.

S: (Tela de menu). Tá "Primeiras Estratégias...tá...os cognatos – Explicação..." Vou com a tela prá frente...tá...acho que seria 'Explicação' ainda , os verdadeiros cognatos, os falsos cognatos, tá, agora os exemplos...tá, agora a próxima tela...tô olhando cada tela dos cognatos. Tá, os exemplos de falsos cognatos que eu tava olhando ainda, né, os cognatos verdadeiros...vou prá próxima tela...tá, os exercícios dos cognatos, achar palavras que parecem cognatos, né, tá, a próxima tela: Let's have some fun' ... um cachorro (inaudível), tá, cognatos acho que é só isso. Abrindo, então, em palavras-chave. Tá...de palavras-chave...tá...Explicação. "As palavras chave...tá, isso aqui já..vou prá próxima tela. Isso aqui...vou dar só uma olhadinha de palavras chave...os exemplos. Isso aqui também...só uma olhadinha...Ah, tá, isso aqui eu já olhei no início...próxima tela...exercícios da palavras chave...o segundo exercício, também...Tá, Let's have some fun, que seria do 'pair of docks' paradox (Ri). Tá. Voltar à tela inicial....deixa eu ver o conhecimento prévio...Componentes essenciais...ah, tá, primeiras estratégias, que eu botei ali...tela anterior...conhecimento prévio...entrar em exemplos. Tá Deu no The New York Times...exemplo de conhecimento prévio, né (Lê o texto em voz alta).(Ri). Tá, próxima tela. Exemplos dois...ah, tá. (Lê alto o enunciado e murmurando o texto). (Continua lendo a explicação). Ah, tá, tá. ... O que é FT? Ah, vou ver a Dica (clica na dica) (Lê a dica em voz alta).

R: FT é o Financial Times, o jornal econômico mais prestigioso da Inglaterra.

S: Tá...não sabia.

R: Por isso que eu disse que prá entender o texto tem que saber o que é 'FT'

S:...o FT

R: ...e a palavra 'tea', a letra T é a mesma pronúncia de 'tea' - 'chá'.

S: É, por isso que eu pensei... porque aqui ó, o Earl Grey tea...que é chá não faz tanta importância, mas...o que sempre tá perguntando é do...

R: Explico o trocadilho.

S: Ah, tá, agora entendi tudo...Ah...

R: Isso tudo é só prá demonstrar como é importante a pessoa saber uma porção de estórias antes prá poder sacar certas coisas. Quando você consegue as informações anteriores à estória, aí...

S: ..já ajuda bastante. Ah, igual o que a professora passou prá nós: achar as pistas...seriam as pistas de um criminoso..e a gente não conseguia achar! Aí tinha um que era prá achar porque que ele tava mentindo. Ele dizia que o dia que ele foi era 31 de novembro, mas não existe 31 de novembro. Um detalhe...Tem que ligar, ficar atento nas coisas. Tá, eu vou passar pros exemplos, né, exemplo 1, tem o ex. 2 e o 3. Ah, tá, esse foi o que eu fiz antes. Seria Conhecimento Prévio, né. Passar prá próxima tela. Tá ex. 2., e ex. 3. (Vai lendo murmurando). Conhecimento Prévio, Task two, exercício, né? (Lê o enunciado em voz alta. Olha o exercício, busca ajuda na Dica). Vou ver a dica. (Lê a Dica em voz alta). Aí seria aqui...tá. (Lê o enunciado novamente). (Tenat raciocinar sobre Columbus...Tá...acho que...(passa para a task 3). Tá. (Lê o enunciado em voz alta. Tenta resolver a questão). (Leva muito tempo). Vou botar as palavras, depois eu vejo se estão certinhas. Tá tem uma Dica. Deixe eu ver uma Dica. (Lê em voz alta). Ë isso aqui...é que eu não tenho muito vocabulário. (Ri). Vou tentar corrigir prá ver (Tecla corrige. Erra). Isso eu não sabia...só os dois aqui...muitas palavras que eu não conhecó, assim. Essa palavra...'demanding'

R: Demanda

S: ...eu pensei que era demanda , cognato, eu fiquei meio assim...deve ser cognato.

R: Acredite! Eu sempre digo pros alunos que quando você achar que é cognato, ache e é mesmo. Só 10% é que não é cognato.

S: A gente...aqui eu pensei que era demanda, mas eu fiquei meio...É, tem algum (?????) que não é cognatos também, né...aqui tudo são, né? O que que é esse ?????? em português?

R: É como em português...não te lembra nada? Avaliar?

S: Avaliar, tá. Ah, seria...as vantagens...é eu fiquei em dúvida aqui mesmo... Tá. (Passa para a task 3 sem completar a 2. Lê o enunciado em voz alta). Tô tentando identificar do que se trata, né. (Vai lendo as opções murmurando). (Vai raciocinado murmurando). Ah, esse aqui é difícil! (Lê as opções em voz alta novamente). Participação da mulher já não é. 'Problema'? 'Problemego'(Ri).'Senlaboreco kreskas', tá, sem labor...Não me parece ser da mulher porque a palavra parece Ter a ver com homem e mulher junto, parece % de civis ou qualquer coisa assim...civis...população...'labor'...pôxa esse aqui...esse é difícil. Tá...(murmura enquanto raciocina). Tá...desemprego....(vai lendo as opções novamente). É vamos vê pela doença, né, mas (opção 1), né, não sei se é, mas eu vou corrigir...(Dá errado). "vamos tentar de novo, escolha errada" (Ri). Essa é difícil...porque 'participação da mulher' não parece ser por causa da palavra aqui que lembra 'civis', [não?] parece que tem uma palavra que lembre mulher. Desemprego muito alto eu acho que seria muito alto , porcentagem ...seria 21%...a outra seria 'milhões'... mas acho que ...não ser a palavra 'milhões', mesmo assim seria muito alto..desemprego, acho também...analfabetismo também seria alto...só se for crise econômica mesmo , não seria uma doença...só se for...(checa e erra). Oh, engana! Agora eu tenho que saber (Ri). Analfabetismo...(checa e erra novamente). Oh, essa aqui, essa aqui é difícil. Desemprego? (checa e acerta). Uh, não parece.

R: Mas porque que não parece?

S: Eu achei que não parecei desemprego, primeiro pelos valores...Espanha 21%? Pelo que parece assim, essa língua ..pelos cognatos essa aqui parece, né? Tá, 'Europa problemego' seria 'problema na Europa', aqui já aparece em milhões _ 'milionoj', né? Aqui é porcentagem, acho Janeiro-setembro em 93. Aqui na Espanha, 23% na Espanha? Muito alto, né? 'laborkapala'...

R: 'labor' não te lembra nada?

S: 'labor'? Ah...não...

R: ...tem no italiano... tem no português...

S: é que eu não conheço muito... essa palavra labor eu não conheço... por isso que eu...

R: Não conhece a palavra 'laborar'? 'colaborar'?

S: Ah, tá...colaborar. Colaborar seria tipo uma pessoa...co-

R: É, seria laborar com. O que é laborar então?

S: Tá, tipo, ajudar, tipo alguém... a fazer algo num emprego...não colaborando, mas seria já a palavra co-...

R: Trabalhar!

S: Ë que é uma palavra que não se usa muito...

R: É o gatilho prá coisa toda...

S: É, eu não conhecia a palavra, já nunca que ia imaginar pela porcentagem... É super legal, gostei desse aqui. O que que é uma palavrinha já...

R: ...É o "31 de novembro"...
S: Hum..dose (Ri)
R: ...uma palavra que desencadeia tudo!
S: ...uma palavra que já faz entender tudo! (Ri). Aqui, tá, aqui já foi tudo. (??????)exercícios (???) acho que não tem mais nada. Vou prá frente, próxima tela, Let's have some fun, esse aqui eu já...acho que não...já, já. Tá,.. .(murmurando rapidinho) ...acho que acabou, né?
R: OK. Thank you very much.
S: Legal, legal (Ri).

Sujeito K

S: Eu falo tudo o que eu faço?
R: Tudo o que você for fazer você fala e tudo o que você estiver fazendo você diz o que você está fazendo.
S: Tá. Eu cliquei no link prá me cadastrar...é eu não posso botar nome completo, mas...
R: Não precisa nome completo.
S: Enviei o meu cadastro...editei a senha e entrei.

Tela de abertura

S: Tô vendo aqui que tá no link (????????)...botãozinho de 'pare'... Cliquei prá próxima tela...
R: (Dando um prompt após um longo silêncio do sujeito). E agora, o que tu tás fazendo?
S: Tô lendo os itens que tem nessa página (Ele lê sempre em silêncio).
R: Tá.
S: Cliquei no ícone maior...no item maior...Primeiras estratégias...agora eu tô olhando o texto...(longo silêncio)voltei...deixô vê. Cliquei em Explicações de cognatos...
R: (Dando um prompt) O que você está fazendo?
S: Voltei prá tela inicial de novo e cliquei no Conhecimento Prévio e tô lendo a explicação dele. Cliquei onde tava escrito prá ver uma dica...(longo silêncio). Voltei prá tela principal...cliquei no Let's have some fun do Conhecimento Prévio...(silêncio enquanto lê) (longo silêncio).
R: (Dando um prompt). E agora?
S: Eu voltei no...cliquei no anterior...cliquei no anterior, só que não é a tela anterior (o que ele quer dizer é que ele queria voltar à tela anterior que ele estava, e não' `a tela imediatamente anterior.) ..não sei.
R: É o Conhecimento Prévio, a tela anterior a que tu estavas.
S: Mas eu não estava nessa tela antes. Não , tu tavas no Let's have some fun'...
S: Hã, hã.
R: ...que é posterior a essa.
S: Ah, tá...
R: tá,...aí tu clicaste aqui, ó...
S: ...então a anterior...
R: ..então, não, tá certo.
S: Tá. (Longo silêncio). Eu cliquei ali prá...o que eu imaginava que seria...
R: ...e corrigiste?
S: Não, vou corrigir agora. (Acerta)
R: Tu tinhas lido, entendeste o texto todo ou foi só um chute?
S: Não, eu imaginava que seria isso, eu sabia 'labor' ...'trabalho'...
R: Ah...!!! Good! Eu não sabia que você conhecia essa coisas de Latim e tudo mais...
S: Não, mas é...'labutar'
R: Dificilmente eu encontro alguém que conhece isso! Que bom! (longo silêncio do sujeito). (Dando um prompt): Agora você tá no Conhecimento Prévio...que tarefa?
S: Na task one. (longuíssimo silêncio). (Corrige e acerta). Respondi o exercício e vou clicar agora no...A task two eu já... foi o primeiro que eu fiz...

R: Task two foi a que fizeste agora, quer ver...?
S: Não..Deixa eu verificar...
R: A task two do Cambodja...Ah, não...
S: Essa é a task One...
R: Right, OK, Ah, yeah...
S: (Longo silêncio).Clique prá ver uma dica, no...Task two...(silêncio)
R: Você pode explicar essa sentença do jeito que você quiser, é a sentença que tem tocar algum sininho na tua cabeça, entendeu? Não tem UMA resposta...
S: Tá, eu já tinha verigficado isso, mas...
R: ...não te lembra nada,...alguém?
S: Não.
R: OK. Três, né?
S: (Task 3. Longo silêncio enquanto faz o exercício) (Corrige. Erra). Troquei os dois aqui...Agora, fazer de novo não tem muito o que(??????)(Rimos)...
R: É, tudo bem.
S:...mas...(Corrige e acerta). (Ri).
R: Agora...
S: ...agora tô aqui no mesmo texto que eu já tinha feito...
R: ...essa é Four, né?
S: É. Só não fiz a ..acho que a (????). (Longo silêncio)
R: Dando um prompt): Você voltou prá...
S: ...voltei prá Task Two. (longo silêncio). Voltei prá tela inicial agora. (Silêncio). (Acessa uma tela ainda desconhecida)
R: Hã, hã...você não tinha visto esse ainda!
S: Não tinha visto isso. É.
R: Essa é a Task Two do Conhecimento Prévio? Não me lembro dessa.
S: É...Task One.
R: ...De novo, porque você não tinha feito toda, né?
S: (silêncio) (Corrige e erra).
R: Mas tá certo...
S: Talvez eu tenha colocado algum espaço...alguma coisa...
R: Talvez as palavras chave estejam voltadas prum aspecto muito específico... (ele corrige novamente e novamente erra). Que que você fez lá?
S: Não, fui ver se tinha algum...porque erro de...de...porque eu simplesmente copiei.
R: É, tá tudo certo. Voltaste prá...
S: Voltei prá página inicial agora. Vou pro Let's have some fun do...das palavras chave...
R: Tá. Por que que todo mundo gosta de começar por aí?
S: Não, porque esse a gente já tem uma noção...já tem uma noção do que que é...isso a gente trabalhava...estudamos agora na faculdade ...já tinha visto no segundo grau e...
R:...quer dizer...é coisa que vocês já sabem...
S: É...se eu imaginasse que não soubesse, eu acredito que...leria a explicação. (Silêncio)
R: Não sei se você sacou essa...
S: Não...tá...essa empresa chama as calças, um par de calças... aí...não sei, deve ter uma relação entre o nome ...e de...de
R: É como você falou...não, mas a gente conhece palavras-chave, segundo grau...mas aí é que tá...se você não pegou a informação anterior...aí chega aqui...entendeu? Não, mas tudo. Deixa eu só te falar, quer dizer...ele não vai te dar a resposta exata, mas é que ele te prepara o tempo todo prá você chegar aqui...Se você ler essa expressão bem rápido, o que é que dá?
S; Pair of docks...
R: Pair of docks...pairofdocks...
S: Paradox? (Rimos).
R: OK. É mais um trocadilho...
S: É alguma coisa ...saber se é...
R: Mas é que tá funcionando.
S: Interessante.
R: OK, e agora, o que é que você vai fazer?

S: Eu quero fazer um exercício agora. Palavras chave. (Silêncio) (Corrige e acerta).
R: Right. E agora?
S: Agora eu vou pro task One. (Silêncio. Digita). (Ri) (???????????)
R: Quando a gente é colocado assim...
S: ...mencionou ...(??????)
R: É...pára aí um pouquinho (????)
S: ...(??????) A análise estilística diz quase a mesma coisa que não...diz quase a mesma coisa..mas...
R: É um exercício aberto, a gente não vai corrigir...ë que como cada um vem de uma área diferente, né...?
S: E como eu valido essa questão?
R: Essa não valida...pode deixear..é assim mesmo.
S: Só tem dois nesse (????0 questões?
R: Não sei.
S: Task Two. (Silêncio).
R: Então você tá agora em..voltaste prás palavras chave...
S: ...palavras chave...eu queria voltar aqui e foi prá essa tela...
R: Tudo bem. Essa é a tela anterior...exatamente...
S: (????????)vai passando aqui, né?
R: É. (Rimos) . Não fica só me perguntando as coisas!!
S: (Ri). Fui novamente no Let's have some fun do... Cognatos.
R: ...dos cognatos. Porque os cognatos não tínhamos acessado ainda, né?
S: ...não tinha acessado...
R: ...mas tu foste direto no...
S: ...fui direto no 'Fun'. É. (Silêncio enquanto lê).
R: Agora, tás voltando prá...
S: ...prá...prá...
R: ... Cognatos.
S: ...cognatos. Task One. (Silêncio enquanto lê e depois digita). (Corrige. Dá errado).
R: : Oh oh. Não tava assim não, tu vê!. É claro que eles são cognatos! (Examino as palavras que ele escolheu): Tá tudo certo.
S: Acho que tem mais cognatos...
R: É, a gente fez o levantamento de todos os cognatos prá botar na programação, entendeu...
S: Tá, então qualquer cognato ele aceita...
R: ...qualquer cognato ele aceita...ele tem que aceitar...porque tu vê, também aqui naquela hora que tu digitaste estava tudo certo...depois ele aceitou...lembra...depois ele...não tava assim...já fiz com outras pessoas... Bom, agora tu voltaste prá tela inicial...
S: É que esse aqui...comecei a voltar aqui...mas ele não tem o mesmo...ele não tem tem o mesmo 'voltar' que esse aqui em cima...por exemplo, prá ir prá página anterior...que eu esperava voltar prá aquela tela, mas fui prá Task One...
R: Ah, sim, tu queres voltar prá página que tu tavas...
S: É...Eu tava no menu principal. Aí eu clico aqui. Veio prá cá. Aí eu vim prá aqui...eu esperava voltar prá aquela mesma tela...entendeu?
R: Hum...Tá
S: ...então, se eu clicasse aqui...e não é o que acontece.
R: ...mas tu poderias fazer isso aqui, ó...Ele não te faz isso aqui, mas ele te faz isso aqui...De algum modo...supre...
S: Só tem um aqui?
R: Não sei! Tens que ver. Bom, esse é o de cognato...task one...tu já fizeste...esse é de palavra chave que tu já fizeste...e agora tu estás na...
S: Eu estou na (inaudível) .
R: Yes! (Rio)
S: O que foi?
S: Não, eu pensei que tu ias embora sem ver a página aí...
S: Não, não...Eu cliquei no exemplo do Conhecimento Prévio...(silêncio enquanto lê). (Ri)
R: Já conhecia isso?

S: Não. (Silêncio enquanto continua lendo). Isso aqui fala sobre a falta de educação dos novaiorquinos, né?
R: Exatamente, hã, hã. E aqui, por exemplo, no caso da carne...Isso. Bom, voltaste prá página inicial, né?
S: Vou ver os exemplos de cognatos agora...(Silêncio enquanto lê). Clico nos cognatos verdadeiros (link)...
R: Voltaste...
S: Voltei prá tela inicial...e vou ver esses aqui de... palavras chave. (Silêncio enquanto lê). Voltei prá tela inicial de novo...Agora não ...tem mais nada...
R: Deu?
S: Hã, hã. (Terminou aqui)
R: OK.
S: Qual que é aquela do 'Colombo'...? (Depois que terminou o experimento ele ainda queria saber como deveria resolver a Task 2 do Conhecimento Prévio!!!)

Sujeito L

Página de abertura

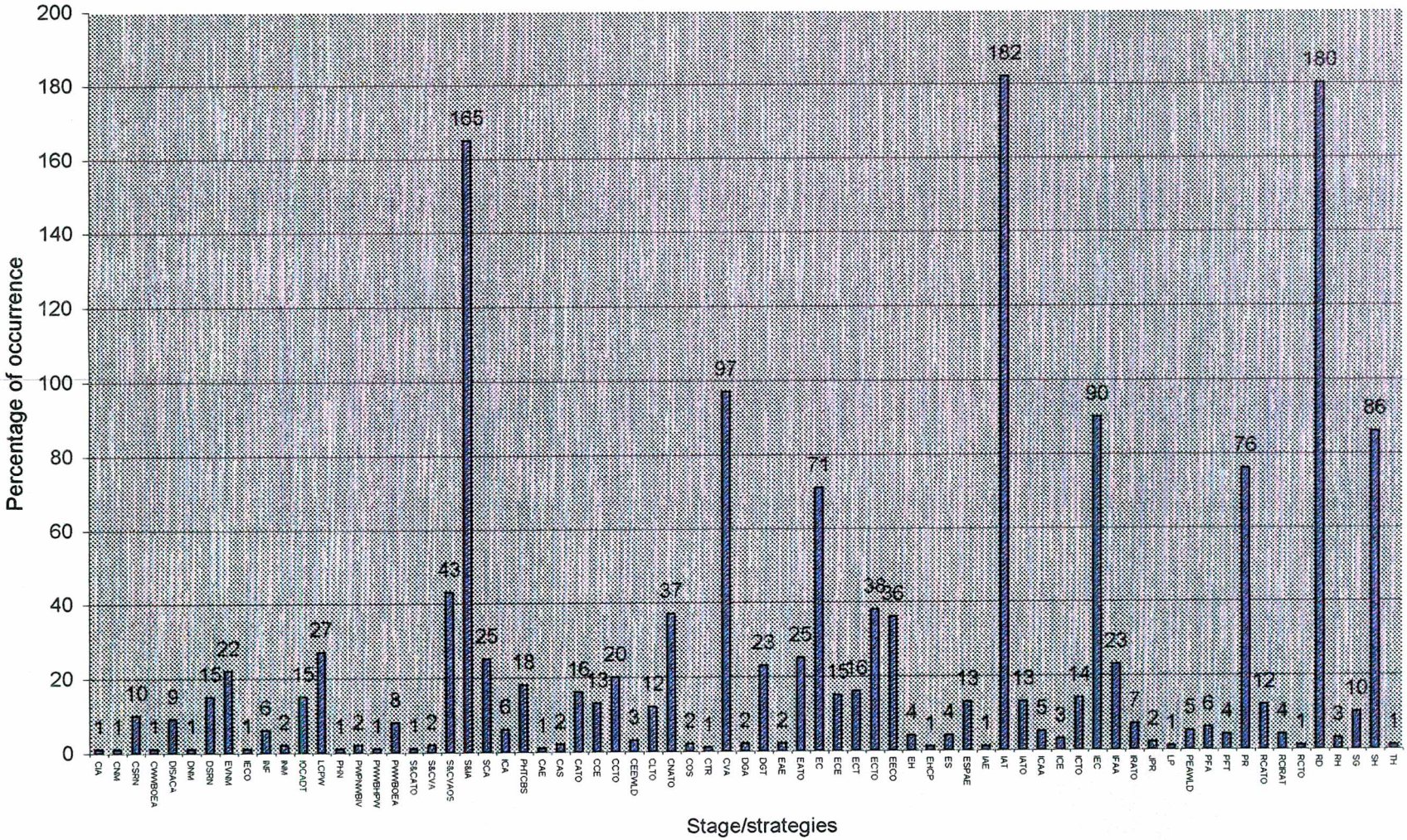
R: (Prompt) O que você tá fazendo agora? Descreve prá mim.
S: Escolhi...posso escolher só o que me interessa?
R: O que você quiser.
S: Tem um conhecimento prévio... quero ver Explicação.
R: Se você escolheu isso, vais ter que ler, porque vai ter tarefas depois...tu que sabes...
S: Hum, hum. (Silêncio enquanto lê). Vou ver essas palavras chave.
R: (Prompt) OK. Então tu escolheste clicar em cima das palavras chave. E aí, você achou o quê?
S: Primeiras estratégias.
R: (Prompt) .Você tá fazendo o que agora?
S: Tô baixando (scrolling) aqui...
R: (Prompt) ...prá ler...sobre..explicação...Primeiras Estratégias, në?
S: (Silêncio enquanto lê)
R: (Prompt). E agora?
S: Vou voltar...Ai, voltou prá principal, então...Queria voltar prá aquela...
R: Dá um jeito...
S: Tá, então vou ver os Exemplos.
R: (Prompt) Exemplo de conhecimento prévio, né?
S: (Silêncio enquanto lê). É muito chato.
R: (Rio). OK, não tem problema. (Prompt) E agora?
S: Vou ver outra coisa. Tô voltando aqui.
R: (Prompt) Tás indo prá...tarefa dois, né?
S: Não, eu queria voltar prá primeira, mas tá...passando por todas...O que é isso. Ah, essa é a ... (inaudível)
R: Hã, hã. OK.
S: Vou ler Explicação de cognatos.
R: Vocês já estudaram cognatos, na tua aula , lá?
S: Um pouco. (Silêncio).
R: (Prompt) Você tá fazendo aí, o quê?
S: Baixando prá poder ler.
R: (Prompt) Você tá nos cognatos...né?
S: Cognatos. Vou ver essas 'pistas' (link). 'Primeiras Estratégias'. É a mesma coisa!
R: Hã, hã.
S: Já vi isso.
R: OK. Você já viu então, background knowledge...
S: Já? Não!

R: É que é o conhecimento prévio. Está em português.
S: Os exemplos, eu já vi? Não, né?
R: (Prompt) Então você tá vendo exemplos de...Cognatos.
S: Cognatos. (Clica no link) Falsos cognatos.
R: Você lembra...você lembra o que é um Cognato?
S: Hã, hã. Esses são os falsos. Isso (referindo-se a um exemplo de falso cognato) eu uso bastante quando eu ...
R: É, né? (Rimos). É até educativo, então, o experimento!!!(Rio). É porque a tendência das pessoas é simplesmente...mas a sorte é que só são 10% das palavras em inglês que são falsas em português.
S: Ah, é?
R: É, hã, hã.
S: Ainda bem, né?
R: (Prompt) Então, você tá fazendo o quê, agora? Você fez o quê?
S: Voltei prá tela inicial...e...
R: Você entende o que significa essa expressão Let's have fun? Quer dizer uma piada, sempre uma brincadeira que se faz no final de uma sessão. Fun 'e uma brincadeira. Queres ver Exercícios?
S: Não. Nem me lembro mais o que é que eu vi! (Rimos). Eu abri agora 'Exercícios' de Cognatos. (Lê em voz alta o enunciado) "Digite três cognatos que você encontrar". Esse...(digita o primeiro (?), depois 'domestic' e depois 'machine'. E agora? Corrigir? (Corrige e acerta). Acertei!
R: Good. Congratulations! OK.
S: Então, prá voltar...aqui, né?
R: (Prompt) Vais voltar prá tela inicial...
S: É...Eu já vi explicação de cognatos, já vi de palavras chave, também, não?
R: Acho que não.
S: Não. Explicação de palavras-chave. (Silêncio enquanto lê). (Inaudível). Acho que já vi foi tudo aqui. Primeiras estratégias. Abri a tela de... palavras chave... exemplos de palavras chave. Então, essas que estão marcadas em negrito é que são as palavras chave. Fazer, então, o exercício, né?
R: (prompt) Você vai fazer a tarefa 1 dos exercícios de palavras chave. Tá.
S: (Ela digita). E agora? Não sei o que fazer.
R: Esse exercício é aberto porque cada pessoa que vem aqui é de uma área diferente. Mas e aí...(Dá um problema qualquer com a tela)
R: Vai prá...bom, vamo ver se daqui a pouco aparece...ou não...ah..
S: Esse é o outro...
R: Tenta só voltar prá ver se apareceu. Não. Mas devia ter aparecido.
S: Tarefa Dois.
R: (Prompt) Tarefa Dois de Palavras Chave. Tá.
S: (Silêncio enquanto lê). Prá associar essas palavras com esses textos?
R: É. Três títulos e 4 textos. Você vai ter que associar esses títulos com os textos. Um vai sobrar, tudo bem , foi posto aí de propósito.
S: Esse 3 deve ser esse do Japão. (Rio). Agora...Ficou ruim porque a barra ficou muito...Eu tenho que subir e descer, né. ?????com B... (Corrige e acerta).
R: Acertaste sem ler nada?
S: Não, eu li...esse aqui eu sabia., e...Eu vi Tóquio e vi Japão e imaginei que fosse aqui...aqui eu li esse e vi aqui "of Leika Holdings" e usei a palavra chave, então a palavra chave seria essa... (Clica de novo no Corrigir e sorri)
R: (Prompt) E agora? Então voltaste prá tela inicial...
S: Tela inicial. Então eu vou fazer o exercício de Conhecimento Prévio que eu não fiz ainda...
R: Tá. Tu te lembras o que é Conhecimento Prévio?
S: Não.
R: (Rio). Não lembra?
S: Ai, eu acho que são as ...o conhecimento que você já tem da área, do texto, né?
R: (Prompt) O que é que você está fazendo agora?
S: Tô lendo o texto prá...Nem sei prá que (ri). Ah, prá ver se eu entendo, né, o contexto..o que se trata esse texto. (Silêncio enquanto lê). Acho que é 'política'. (Corrige e acerta). Ó, acertei aqui.
R: Ah, acertaste! Vai lá de novo, no exercício de novo...não, só prá eu ver..
S: "Indique a área, né, onde o texto se insere."

R: Tu marcaste o quê?
S: Política.
R: Por quê?
S: Porque fala de problemas no Cambodja, fala do governo americano, então eu acredito que é mais política.(Corrije e acerta) (Sorri) R: É bom, né?
S: É. Acertei tudo, né? Tô bem!
R: Legal! (Prompt) E agora você voltou prá página inicial...
S: Voltei prá página inicial. Ah, não sei mais...
R: Então, queres fechar?
S: Acho que sim. É mais ou menos dentro do que eu já... aprendi, né...
R: OK.

APPENDIX L

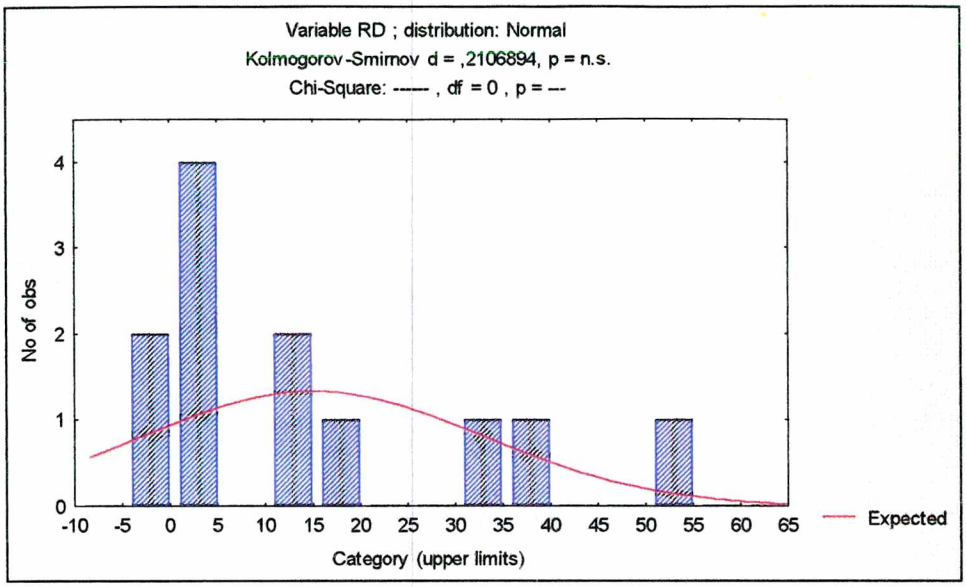
Stages/strategies identified in the think-aloud protocols with acronyms



APPENDIX M

GRAPH A

Illustration of distribution for Read Documentation (RD)



GRAPH B

Illustration of distribution for Problem Report (PR)