

A Critical Approach to Multiliteracy: *Automates Intelligents*¹

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Abstract. In this paper we present and analyse a website with a complex rhizomatic structure in connection with the results of a cybertask in which students were asked to read various information sources by navigating a range of websites. The results and discussion include issues such as: a) culture of learning and students' task representation; b) possible relationships between learning styles and ways of navigating and managing information to solve a task; c) criteria students use to evaluate their navigation practices.

Keywords: Multiliteracy, autonomy, learner culture, cybertasks, learning styles

1. Introduction

“A critical approach to multiliteracy: *Automates Intelligents*” analyses a website with a complex rhizomatic structure. We examine its architecture in relation to the results of students' navigation during a cybertask. The cybertask involved students' reading various information sources using external and internal links on the *Automates Intelligents* website, which is characterised as multilinguistic, multimodal (graphics, images, videos, audio recordings), interactive (search tools, e-mail, blogs) and rich in internal and external links.

The difficulty of the task was offset by placing it in context through a previous teaching-learning process to familiarise students with the subject and enable them to understand the cybertask questions. This prior experience gave meaning to the information search on the proposed website. The task was designed to incorporate features of what we consider to be the latest generation of WebQuests: a) *includes resources that incorporate a gateway to the web*; b) *proposes a task dynamic that favours cognitive strategies for knowledge building*: relate the type of reading to the task goals; find the aspects in the text that are relevant to the search being made, and relate them to information found in other texts (develop field independence); construct analogies and contrasts, establish inferences, generalise, creates synthesis, etc.; c) *involves the development of autonomy related skills*: methodological, cognitive, and metacognitive skills. Through the task results and the students' self-evaluations we hope to contribute to defining criteria in the design of what we term “cybertasks”.

The principles behind this research and the design of the cybertasks are based on a socio-constructivist approach. The cybertask we propose here may thus be considered as an initial test from which we can draw conclusions on students' previous knowledge and skills. Bearing in mind the essential interactivity between the three sides of the pedagogical triangle (teacher, student, resources) we aim to answer the following questions:

- What are the features of our students' teaching-learning culture?
- What representation of digital texts do they have and what should be the foundations for the teaching-learning dialogue on the use of Internet resources?
- Are navigation strategies and learning styles related?
- Are website architecture, learning styles and students' navigation maps related?

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- Can navigation models or patterns be identified? With what criteria?

The latter two questions will be dealt with in other publications once the data analysis process is completed. In the present study, we present the results and discussion on aspects relating to students' representations such as: a) perception of the structure of the digital texts; b) conception of the learning tasks and the information search; c) their habits in using different languages to access information content; d) their level of satisfaction with their management of various information sources to carry out a selection and synthesis adapted to the task objectives; e) degree of familiarity with and use of hypertext navigation, multimodality and interactivity.

2. Materials and Resources

[*Automates intelligents*](#) is a website designed to spread information and present articles on science and society, particularly on aspects of artificial intelligence. The articles on *Automates Intelligents* are hosted on the [*Kiosque*](#) of the French *Institut de l'Information Scientifique et Technique* (INIST) at the *Centre National de la Recherche Scientifique* (CNRS).

The website is closely linked to a larger website [*Admiroutes Sciences, techniques et démocratie*](#), which receives between 800 and 1200 visitors per day and was originally set up by public authorities to encourage the introduction of ICT into the French administrative system. This website has an associated site that defends the independence of Europe as a scientific and technological force: [*Europe puissance scientifique*](#) and offers links to the Association [*PanEurope*](#) and the journal [*Europa++*](#), which has the collaborative support of *Automates intelligents*. In addition, *Admiroutes* has its own journal, *La Gazette d'Admiroutes Démocratie et nouvelles Technologies*, but is also publicises and hosts the *Automates Intelligents* site and two types of associated publications: firstly it lists the *Automates Intelligents* catalogue and presents its book collection (produced in paper form by the publishing house Vuibert, part of the Albin Michel group, and also available through Amazon) and, secondly, it hosts the free monthly journal [*La Revue. Robotique*](#).

The close, inclusive relationship shared by these websites meets two criteria: a) the reflective scope and specific objectives of each site: democracy and new technologies in the case of *Admiroutes*, science and society in the case of *Automates Intelligents*, and European political science in the case of *Europa++*; b) common objectives or shared ideology: the spread of knowledge, and the use of Internet and new technologies as tools to serve democracy and development.

The blue shades and logos used create an effect of unity between the two websites. The *Admiroutes* compass rose logo, which alludes to Larousse's famous motto *Je sème à tout vent*, is a generic link on *Automates Intelligents*. A further icon used by *Admiroutes* is the mirror, and the *Automates Intelligents* website is publicised on the *Admiroutes* page as a mirror site: *Le site miroir d'Automates Intelligents* ("site de travail et d'archivage"). This reference to the work and archiving process is explained by the fact that the *Automates Intelligents* site incorporates two knowledge diffusion systems: the pre-publication of articles on the site, which allows readers to consult work in progress, and the e-journal *Automates Intelligents*, the archives of which are also available through the INIST *Kiosque* and *Admiroutes*.

The bilingual (French and English) presentation of *Automates Intelligents* in *Pourquoi ce site?* corresponds to an [*editorial*](#) written by Jean-Paul Baquiast and Christophe Jacquemin in October 2000. This date marked its appearance as a generic internal link that may be consulted as an introduction to the site and to the journal of the same name. This presentation clearly explains that the *Automates Intelligents* site was created to spread knowledge, to reach a wide range of sectors in the community, and to use Internet resources to facilitate the






publication of work and interaction between scientists and citizens. As stated in Baquiast and Jacquemin's editorial, the *Automates Intelligents* website aspires to contribute to the spread of knowledge from an interdisciplinary perspective. It is presented as a "French site" pursuing plurilingual and Europeist ideals. Its philosophical and political conception makes an explicit commitment to the spread and democratisation of knowledge, and to that end it aspires to promote interactivity with its readers. *Automates Intelligents* is a partner of the science.gouv.fr portal, a scientific Internet reference aimed at a wide public, and of the Futura Sciences website, for its dossiers on artificial intelligence.

Our description begins with the first page of the *Automates intelligents* website, which we consulted at various times to check any possible variations. An increased use of multimodality and interactivity was noted in sections such as *A voir*, *Voir l'émission*, *A écouter*, *Chat*. In previous consultations, made from June to October 2006, sections such as *Blog Échanges*, *Proposez vos manuscrits* and *Courrier* already existed, but audio and video, and links to mass media broadcasts did not feature so predominantly as they do today.

The website pages have blue margins containing the generic links present in all the pages. The main navigation menu is found on the left, together with the logo, which is activated as a link to *Admiroutes*. Numerous external links both in French and in other languages appear, classified by subject. These are accessed through the menu's *Liens utiles* link. Generic internal links appear at the top and the bottom; at the top: the *Automates Intelligents* logo, *Help*, *Site map*, *Subscription* and *Contact*, and a dynamic link that provides access to the *Automates Intelligents* journal collection. At the bottom of the page the team and the editorial staff are presented, along with the list of partners, and subscriptions and contact information. Some of these links are repeated at the top and the bottom because the nature of the page frequently makes scrolling necessary. The right-hand margin offers various types of links: tools for searching both the site and the Web; subscription to the monthly newsletter, the link to which provides access to consult back numbers through the INIST *Kiosque* a link to the publishing house Vuibert for the purchase of books from the *Automates intelligents* collection; a link to the page with information on how to submit manuscripts; a link on automatons in the *press, radio and television* media, that offer audio and video, and an internal link to Paul Baquiast and Christophe Jacquemin's editorial, *Pourquoi ce site ?*

The central section of the homepage is divided into two parts. The first part includes advertisements related to the site (for example the journal *PanEuropa+++*) and announcements and links to two blogs: [Le blog d'Automates Intelligents](#) and [Le blog de Philoscience](#). The second section in the central part illustrates different current topics with coloured images on a white background. These consist of summaries offering links to further reading on these news items, articles and interviews. Finally, the column to the right of centre lists news items chronologically by date and title, the text of which is activated as a link to the full news item. The numerous internal and external links allow the user to both cross-reference site contents and access related information on other sites and original articles for which summaries and reviews are provided. This dynamism opens out the website to reveal its multilingual facet.

The colours of the C-map (Figure 1), illustrating the description given above, correspond to the following link types:

- Actions (search, purchase, subscribe...) 
- Generic internal links (appearing on all the website pages) 
- Semi-generic internal links (appearing on all pages at the same level) 
- Intra-page command 
- External links 

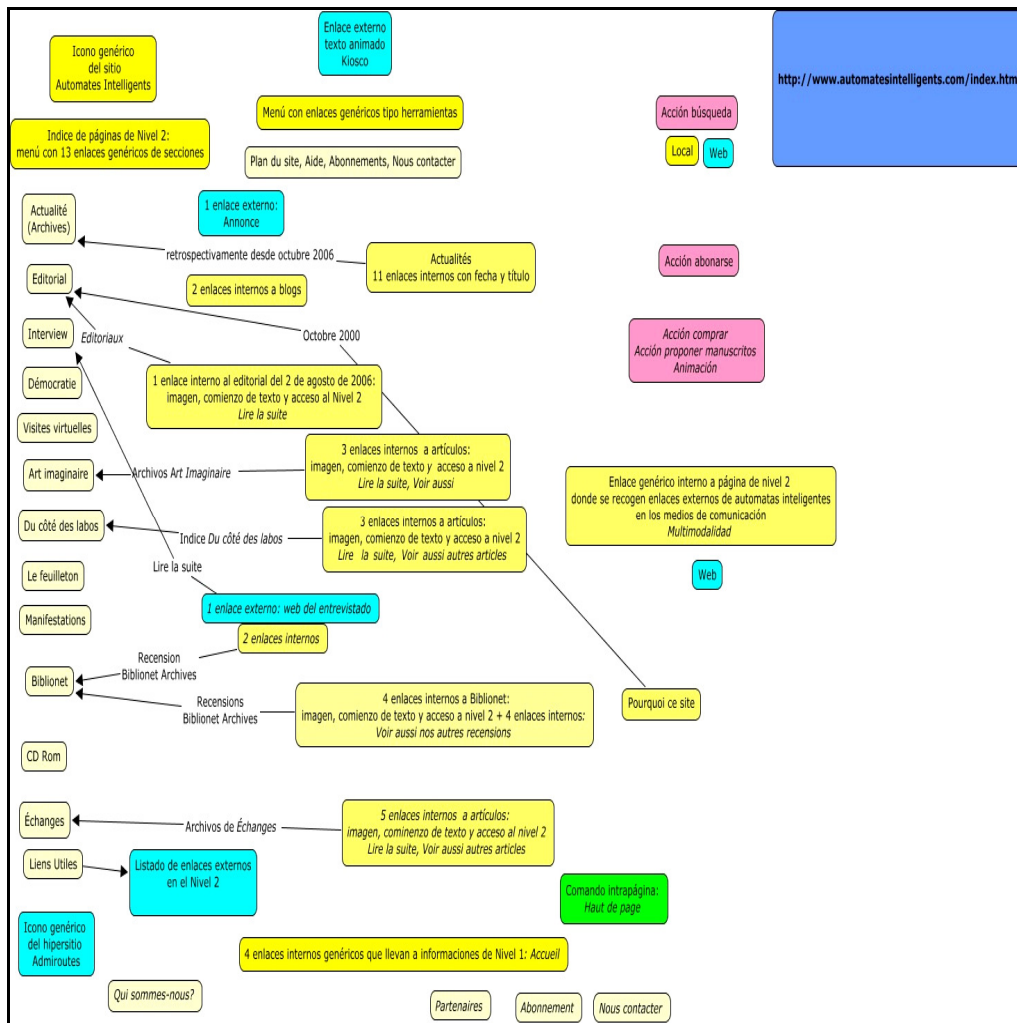


Figure 1. C-map representation of the *Automates Intelligents* website

NOTE



Generic Icon of AI website

Menu with tool-type generic links

Level 2 page index:
menu with 13 generic links to sections

News
11 internal links with date and headline

2 internal links to blogs

1 internal link to editorial dated 2 August 2006:
image, beginning of text and access to Level 2

3 internal links to articles:
image, beginning of text and access to Level 2

3 internal links to articles:
image, beginning of text and access to Level 2

Generic internal link to level 2 page

Sanz Gil, Mercedes and María Luisa Villanueva Alfonso (2008) A Critical Approach to Multiliteracy: *Automates Intelligents. CORELL: Computer Resources for Language Learning 2*, 64-82.

where external links are found to AI in the media
Multimodality

2 internal links

4 internal links to Biblionet:
image, beginning of text and access to level 2 + 4 internal links

5 internal links to articles:
image, beginning of text and access to Level 2

4 generic internal links that lead to information on Level 1



External link
animated text
Kiosque

1 external link

1 external link: interview web

List of external links in level 2
Generic link of Admiroutes hypertext



Action search

Action subscribe

Action purchase
Action submit manuscripts
Animation



Intra-page command

Retrospectively since October 2006
October 2000
Art Imaginaire Archives
Du côté des labos index

2.2. Website Multigenericity and Intertextuality

The website is clearly intergeneric. The *Automates Intelligents* terms “archives”, “monthly publication”, “editorial”, the “monthly” “journal” and “subscription” (free) refer to the e-journal but the site also has blogs, forums, chats and links to press articles, and radio and television broadcasts. Moreover, the boundaries of known generic structures are blurred and open up into other texts, which leads to a tendency to blend genres that facilitates intertextual relationships. This aspect is illustrated by the website’s virtual library page [Biblionet](#), which presents an informative text that includes a critical review of a publication on humanoid robots. In this text, the comments written by website staff are interlinked by the phenomena of

intertextuality with other critical comments from the book's publishers and with graphic schemas proposed by the publishers, and an external link is provided to their web page. The text also includes links to related subjects that take the reader to online articles, to sales information with links to shops selling robots like [ROBOPOLIS](#), to bookshops and even to an advertisement for a show at Futuroscope.

Not only is *Automates Intelligents* solidly intertextual because of its spectacular structure, but it also contains a large variety of genres: news, articles with a structure of links that open onto the Web, chats, blogs, etc. One illustration of this facet is its publications [index](#) where the visitor can select a back number and access the content index [Actualité Archives](#). For example, one might select "[Un robot contrôlé par des neurones de rat](#)" which at the same time contains a selection of internal and external links in different languages: "Pour en savoir plus: Lire [notre article plus complet](#), rubrique Du côté des labos"; "Communiqué de presse de l'Université de Reading (en anglais): [Press releases](#)".

This diversity of registers reflects the site's dissemination policy, but also its determination to serve the scientific community as an instrument for diffusion. Hence, *Automates Intelligents* has become a manager of polyphony and multimodality. The boundaries of known generic structures are blurred and open up into other texts, which leads to a tendency to blend genres that facilitates intertextual relationships. This aspect is illustrated by the website's virtual library page [Biblionet](#), which presents an *informative text* that includes a *critical review* of a publication on humanoid robots. In this text, the comments written by website staff are interlinked by the intertextual phenomena with other critical comments from the book's publishers (FYP) and with graphic schemas they propose, and an external link is provided to the FYP web page. In addition, the text includes links to related subjects that take the reader to *online articles*, to *sales information* with links to shops selling robots such as [ROBOPOLIS](#), to bookshops and even to an advertisement for a show at Futuroscope.

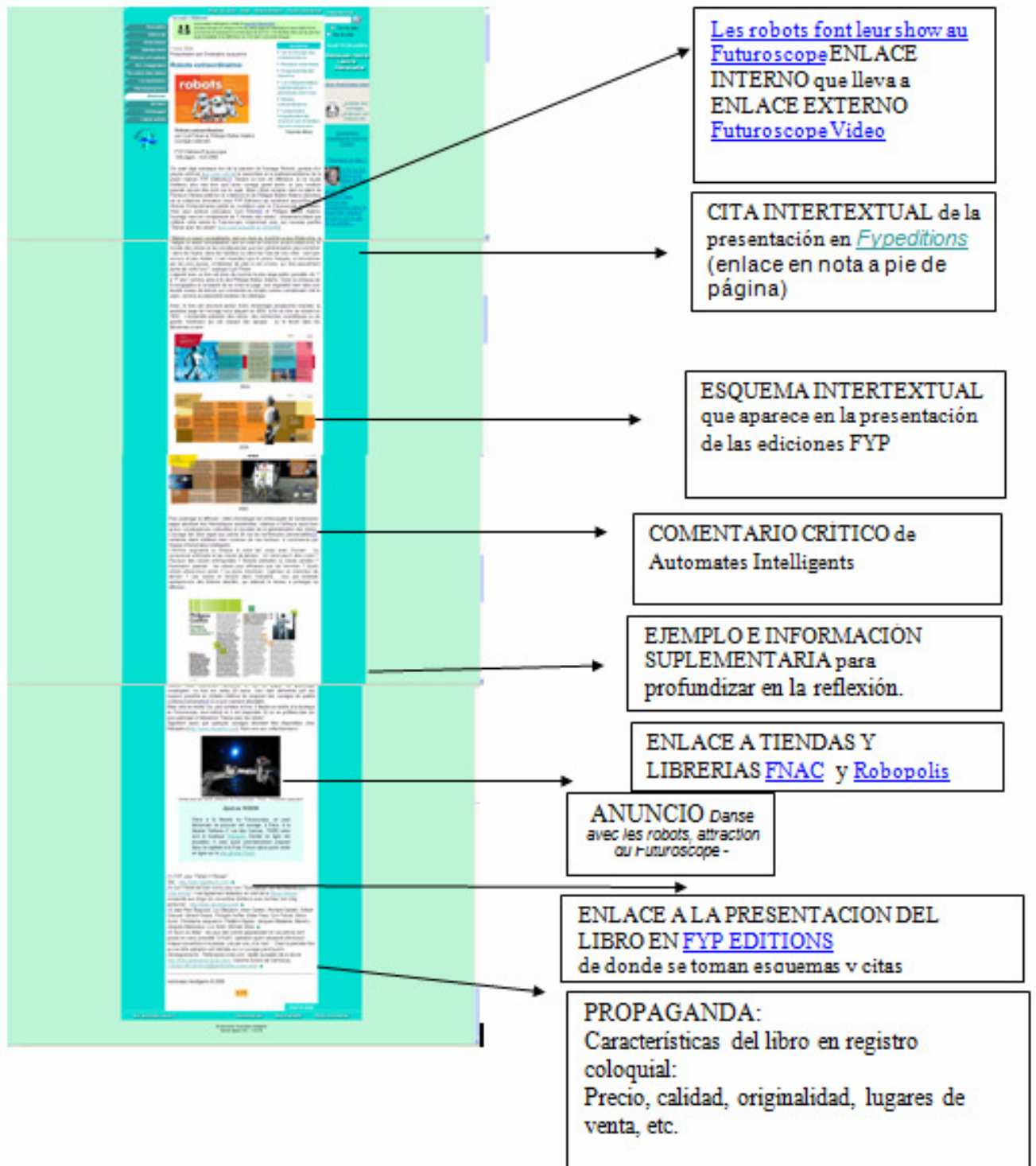


Figure 2. Example of intertextuality in *Automates Intelligents*

Les robots..... INTERNAL LINK leading to EXTERNAL LINK Futurescope...

INTERTEXTUAL CITATION of presentation in *Fypeditions* (link in footnote)

INTERTEXTUAL SCHEMA appearing in the presentation of FYP editions

CRITICAL REVIEW of *Automates Intelligents*

EXAMPLE AND SUPPLEMENTARY INFORMATION for more in-depth reflection.

LINKS TO SHOPS AND BOOKSHOPS FNAC and Robopolis

ANNOUNCEMENTFuturoscope

LINK TO BOOK PRESENTATION IN FYP EDITIONS where schemas and citations are found

ADVERTISEMENT:

Characteristics of the book written in informal register:

Price, quality, originality, points of sale, etc.

2.3. The webpage architecture: spectacular hypertext and graphic structure

Admiroutes introduces itself (in French and English) as follows:

We have initiated Admiroutes web server and community 4 years ago. The [idea](#) was to encourage modernization of public administration by using systematically Internet. One may remember that in 1995-96, France in general and government specifically were not at ease confronted to this technology and the new behaviors generated by it. As enthusiastic internauts, we had to do something. So we launched this small vessel www.admiroutes.asso.fr. Our initiative was purely private and non commercial. Civil servants who accepted to participate did it on a voluntary basis, without any support from administrations, and at home, during their leisure time. We paid collectively the expenses, without accepting publicity. One can consider to day that Admiroutes is relatively a success. The name is pretty well known and referred by portals. The server registers an average of 800/1200 distinct visitors a day. Thousands of pages are monthly telecharged or printed. More than 50% visitors come from not francophone countries, which is encouraging as the site is still entirely in french, by lack of money and time for translation. Our Gazette is distributed to some 1000 free subscribers, who receive it in their mail-box every fortnight.

Admiroutes currently hosts series of sites with varying functions, but which are closely related and make up a type of subject-based network with contents that interconnect through *Admiroutes*, which acts as a distributor and amplifier of information on the sciences, technology and democracy. *Admiroutes* uses the metaphor of mirrors to refer to *Automates Intelligents*. The magazine [La Revue Robotique, Vie artificielle et Réalité virtuelle](#), located in *Admiroutes* is described as a mirror site, “Le site miroir d’Automates Intelligents (site de travail et d’archivage)” and shares headings such as “Feuilleton” or “Du Côté des labos” with *Automates Intelligents*. The *Automates* website is announced on the first page of the *Revue* and the relationship between INIST², *Admiroutes* and *Automates Intelligents* is made perfectly clear. The mirror effect is explained as part of the knowledge creation and diffusion process:

Nous sommes heureux d'annoncer sur *Admiroutes* notre site "automates intelligents", qui est disponible sur <http://www.automatesintelligents.com> depuis le 12 décembre 2000. Ce

² Institut de l'Information Scientifique et Technique d u Centre National de la Recherche Scientifique: <http://www.kiosqueist.com/wsympa.fcgi/info/automates-intelligents-txt>

site est aujourd'hui hébergé par l'[INIST](#), choix dicté par notre volonté de bénéficier de la plus large des audiences sur un sujet qui nous semble fondamental en ce début de siècle. Une publication régulière d'informations et de textes extraits du site, sous forme d'une revue bi-mensuelle (*mensuelle depuis le 1er janvier 2003*) par abonnement gratuit, est assurée sous notre direction. Par ailleurs, nous publions sur le *site d'Admiroutes*, sous la présente adresse, une revue mensuelle Automates Intelligents, qui nous servira de réserve de textes en pré-publication destinés à alimenter le site Automates intelligents et la revue. Cette technique nous permettra également d'obtenir le cas échéant la pré-lecture de certains articles par les personnes intéressées.

The diversity of versions among *Admiroutes–Automates Intelligents–La revue– Automates Intelligents* creates a play of mirrors in which amplifications, variations and points of intersection are all present.

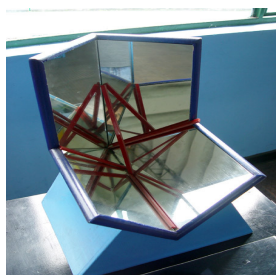


Figure 3. The mirrors metaphor

The graph produced with [WebSPHINX](#)³, a program that browses and processes Web pages automatically (a web crawler, also called a robot or spider), and the editing program [yEd Graph Editor](#)⁴, which enables the structure to be visualised, confirms the structure of the mirrors that are also multiplied by the existence of numerous external links as seen above in the conceptual map (Cmap) representing the link types.

³ WebSPHINX: <http://www.cs.cmu.edu/~rcm/websphinx>

⁴ yEd Graph Editor: <http://www.yworks.com/products/yed>

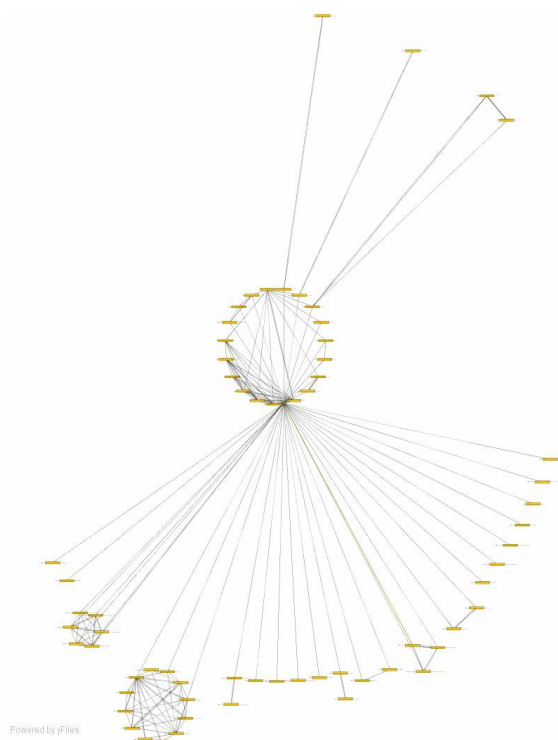



Figure 4. Graph of the *Automates Intelligents* website architecture

3. Description of the cybertask *Actualidad y futuro de la Robótica y de la Inteligencia Artificial* (Current situation and future of Robotics and Artificial Intelligence)

The *Automates Intelligents* website described above is the starting point for the cybertask [Actualidad y futuro de la Robótica y de la Inteligencia Artificial](http://www.giapel.uji.es/cibertareas/WQ-Robot/index.htm)⁵. It is an educational and training exercise for students of French as a second language within the context of the “Second Language and Literature III (French)” taught at Universitat Jaume I of Castellón as an optional subject for English Philology students and as a Free Choice subject for students on other courses. It is related to subjects covering work on knowledge transmission, myths and legends, stories of anticipation and popular scientific text discourses. The cybertask activities required students to relate previous work done on the subject within a conventional class context using other resources (audio documents, video, debates, etc.) to information available in the Web resources referred to in the description of the cybertask. They were asked to respond to a series of questions on the current situation and the future of robotics and artificial intelligence, basing their answers on information from the Web and evaluating the reliability of the sources. The questions are presented in Figure 5 (the cybertask is referred to as “Activity 4” since it comes within the framework of previous activities on human-form robots):

⁵ Cibertarea *Actualidad y futuro de la Robótica y de la Inteligencia Artificial*: <http://www.giapel.uji.es/cibertareas/WQ-Robot/index.htm>

ACTIVIDAD 4



1. Poner en común todas las informaciones obtenidas y, tras un debate de grupo, **intentar llegar a respuestas consensuadas sobre las preguntas siguientes:**

- ¿Cuáles son las tendencias actuales de la Robótica? Ejemplos y referencias Web.
- ¿Cuál es la realidad y la vigencia de la investigación sobre robots humanoides? Ejemplos y referencias Web.
- ¿Cuál podría ser una clasificación de los tipos de robots según sus funciones y aplicaciones? Ejemplos y referencias Web.
- ¿Cuáles son los retos actuales de la investigación sobre la inteligencia artificial? Ejemplos y referencias Web.
- ¿Podrán los robots realizar todas las tareas que realizan hoy los humanos?
- ¿Cuáles son ya y podrán ser en el futuro las aplicaciones en el campo de la medicina? Justificar con informaciones obtenidas y decir las fuentes.
- ¿Los robots mecánicos dejarán obsoletos los trasplantes orgánicos?: SI; NO; ¿Por qué?
- ¿La inteligencia artificial tiene limitaciones insalvables en relación con el pensamiento humano?: SI; NO; ¿Cuáles?
- ¿Pueden plantearse problemas éticos?: SI; NO; ¿Cuáles?

Figure 5. Activity 4 of the Cybertask

Activity 4

1 Present all the information you've gathered and, following a group debate, try to reach a consensus over the answers to the following questions:

What are the current trends in Robotics? Give examples and web references.

What is the current situation and validity of research into humanoid robots? Give examples and web references.

How might robot types be classified according to their functions and applications? Give examples and web references.

What are the present challenges facing researchers on the subject of artificial intelligence? Give examples and web references.

Will robots be able to do everything humans can do today?

What are their present and possible future applications in the field of medicine? Justify your answers with information you've found and cite your sources.

Will mechanical robots make organ transplants obsolete? Yes? No? Why?

Does artificial intelligence have insuperable limits as compared to the human thought process? Yes? No? What are they?

Might ethical problems arise? Yes? No? What are they?

The complexity of this task lies in the fact that word-for-word answers are not to be found on the webpages. The questions are worded in such a way that students must look for examples and justifications for their answers, and because of the nature of the webpages, students must read in a non-linear way and cannot simply “copy and paste” but must construct their answer by comparing and contrasting information from the various links.

From an educational and research perspective this cybertask departs from traditional language teaching-learning schemas because of its highly complex nature. It was devised to discover whether students were capable of taking advantage of the multimodality offered in the webpages to solve the task, and aims to strengthen and assess non-linear hypertextual reading skills.

Activities were carried out prior to the cybertask as part of the necessary data gathering research stage. These activities required the students to complete two tests, the results of which provided essential information on their profile and characteristics for subsequent interpretation of the navigation data obtained during the cybertask. One learning style test provided information on the students’ learning profile, and a level test, based on European Language Portfolio criteria, gave us information on their command of various communicative competencies. Finally, after completing the cybertask, students were asked to fill in a self-assessment questionnaire on their performance of the task. These tests and questionnaires can be consulted in the annex to this monograph.

In addition, as a complement to this activity and within the context of the course subject, a discussion forum was set up for students in which they could freely express their feelings about and reactions to the cybertask after its completion. The students’ comments helped us shape our interpretation of the results and the data.

4. Results of the Cybertask: difficulty in managing complexity

This French as a foreign language cybertask was performed by 13 students at Universitat Jaume I. All of them studied French as their second foreign language, after English, and had levels ranging from A2 to B1 in the language according to the European Language Portfolio scale. Although the size of the sample is limited, the results were sufficiently significant to enable us to draw initial conclusions on the behaviour of university level foreign language students when faced with a task that involved browsing, navigating and reading Web resources in which hypertextuality and multimodality were important features. The task also required students to construct new knowledge by selecting and synthesising information.

Because of the small sample size, the percentages given in the figures are of no statistical value, but they are used to illustrate the qualitative analysis of the data.

4.1. Self-evaluation questionnaire

We obtained information on the following aspects from the overall results of the self-evaluation questionnaire:

- a) **Technical IT skills** used in performing the task. Seventy percent of the students were competent in and used various computer tools: Internet searches, text processors, email, etc.; 30% showed a lack of technical competence during the task, for various reasons: lack of knowledge about the subject, inability to find the right thread, weariness with Internet searches, slow typing skills and “eye fatigue”.

- b) All but one student answered the question **which skill would you like to improve**, with responses ranging from a vague “all”, to information search and selection criteria and the more advanced programming and Website creation skills.
- c) Regarding the **criteria** used to select information during navigation, Figure 6 shows that 70% of the students used keyword searches as their first criterion, followed by importance of the information content and how easy the pages were to read in relation to knowledge of the language (40%):

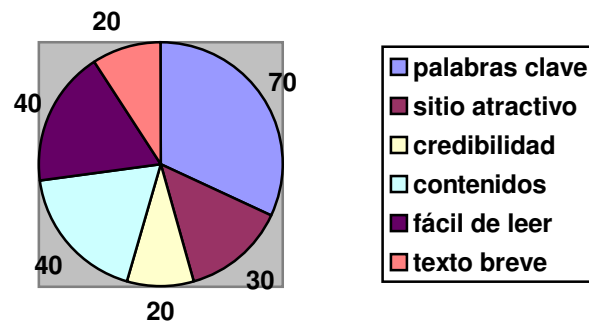


Figure 6. Selection criteria⁶

Keywords
 Attractive website
 Credibility
 Content
 Ease of reading
 Brief text

Keywords was the most commonly used criterion for selecting webpages, doubtlessly as a result of the widespread use of this information search method in general Internet use. Some students considered the absence on the *Automates Intelligents* website of any space to search by keyword, similar to that of google, to be a drawback: “not knowing how to formulate the exact expression and have *recherche* look for it was a problem for me”.

- d) The results on **information management** efficiency (see Figure 7) provide data on two aspects: a) on the use of resources and b) on students’ perception of them. The majority (80%) used the resources by randomly consulting the links offered and subsequently selecting those of most interest to them. The same percentage of students handled the information from documents in different languages; recall that these students were all bilingual (Spanish and Catalan) and studying French as a second foreign language.

⁶ The values in the circular figures correspond to the percentage of students that chose the option “for me it is the essential criterion” from the scale: “I don’t consider it”, “It is important, but does not determine my decisions”, “It is a criterion I very much bear in mind” and “For me it is the essential criterion”

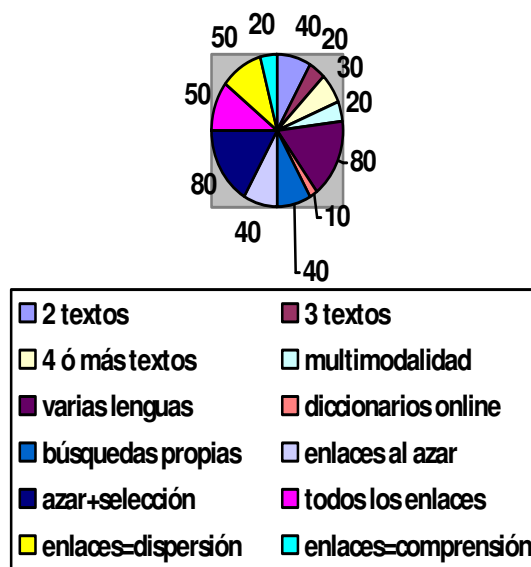


Figure 7. Information management efficiency⁷

2 texts
 4 or more texts
 various languages
 own searches
 random+selection
 links=dissipation

3 texts
 multimodality
 online dictionaries
 random links
 all links
 links=understanding

Students perceived the resources as follows: half claimed that the links dissipated their search, while only 20% stated that they helped them to understand.

- e) The following figure shows students perception of the webpages’ **interactivity** and the use they made of this possibility to interact with the page and with other users. This figure includes the responses “often” and “nearly always” in the scale: “rarely or never”, “sometimes”, “often” and “nearly always”. Seventy percent of the webpages consulted by the students offered interactive resources such as blogs, forums, chats, e-mail, etc.; however only 20% made use of these “often” and 10% used other interactive resources on their own initiative (personal e-mail, virtual classroom, etc.) to resolve doubts or exchange information.

⁷ The values in the circular figure correspond to the percentage of students that identified with each one of the statements related to information management (Part 1 Section 3 of the self-evaluation questionnaire, see annex).

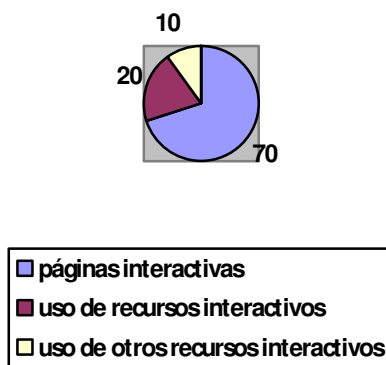


Figure 8. Perception and use of interactivity

Interactive pages
 Use of interactive resources
 Use of other interactive resources

- f) The **webpages most highly valued** and considered most interesting were those that reminded the students of other pages they usually use or that offered immediate information, e.g.: “the PEKEE because it provided information on different types of robots”, “www.pekee.com because the structure of the page seemed easier to understand and google.es because it’s a page I know well”, “I thought robopolis.com seemed interesting because of the different robot types I saw”.
- g) **Comprehension of the foreign language** is not a determining factor for performing the task; all the students indicated that the French language had not given them major problems: “French is easy to understand because of its similarities with Spanish”, “I read all the pages in French and more or less from the context I was able to understand them”. The greatest difficulties were caused by the density of the information provided: “it wasn’t the language, but rather the fact that I couldn’t find the information”, “so much information made it a bit confusing”.
- h) Regarding **previous knowledge** on the subject of the cybertask, 60% had some notion and 20% were fairly well acquainted with it. The activity took place within the context of the course syllabus and students had done prior introductory activities in class. Only 20% claimed to have had no previous knowledge on the topic.

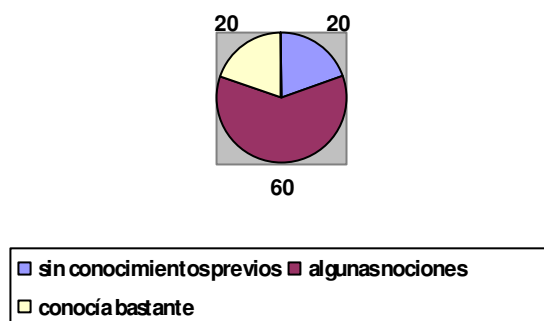


Figure 9. Previous knowledge on the subject of the cybertask

No previous knowledge
 Some notions
 Fairly well acquainted

- i) We used a bar graph to represent the results of the students' **degree of satisfaction** on their performance of the task, as this allowed us to cross data; first the items evaluated: i) on the use of Internet to complete the task, ii) to find new information, iii) to build new knowledge, iv) on the individual work, v) the use of the foreign language to access general information, and vi) on the influence of the use of Internet and the information search tasks to improve their knowledge of the foreign language; second, the value scale indicating the degree of satisfaction: i) low, ii) medium, iii) high, iv) very high.

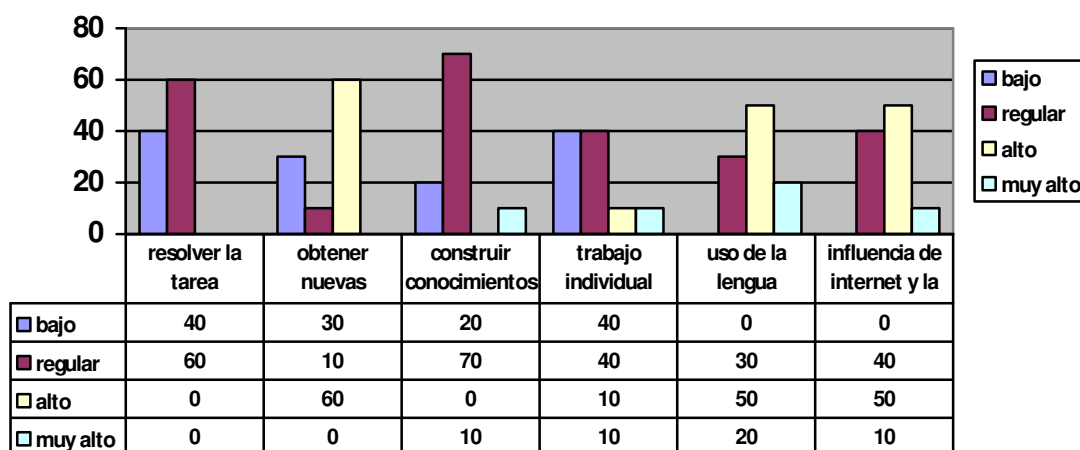


Figure 10. Degree of satisfaction in performing the task

Low
Medium
High
Very high

Solve the task
Find new information
Build knowledge
Individual work
Use of language
Influence of Internet and the task on learning the foreign language

- j) Other evaluations and comments from the students were related to the difficulty of finding the required information, the complexity of the *Automates Intelligents* website, the number of pages accessible from it and finally the specialised nature of the subject.
- k) Only three students mention strong points in performing the task: “the search in other pages”, “synthesis capacity”, “it is not a new subject for us”, “we have worked on robots in class”. The remaining students only responded to the weak points: “I wasn’t able to answer some of the questions”, “it took me a while to work out the *Automates Intelligents* webpage”, “I didn’t find the information I was asked for”, “ability of expression”, “the excessive number of unclear links for the questions set”, “the page wasn’t particularly attractive or visual”, “my lack of motivation about the subject”, “too many links”, “it would have been easier to respond to the questions by referring to other pages like google.es”, “the task was fairly complex”, “perhaps the problem was that the answers didn’t appear as such, but we had to read various pages and then put our answer together”.

Indeed, this final comment perfectly describes the purpose of the task; this however was perceived negatively by the students.

5. Discussion and partial conclusions

In this chapter we give a foretaste of some elements for discussion that will subsequently be examined in relation to the results of tasks on other languages presented in this monograph, and with later studies:

- a) Both help resources and interactivity options are underused (e.g.: *logiciel Alexandria* to clear up vocabulary doubts in the case of *Automates Intelligents*). Of the websites the students consulted, 70% offered interactive resources such as blogs, forums, chats, e-mail, etc.; yet only 20% made use of these “often” and 10% used other interactive resources on their own initiative (personal e-mail, virtual classroom, etc.) to resolve doubts or exchange information.
- b) The students who reported not knowing “how to spell the search words correctly” did not take advantage of the text on the webpage and in the task to write their keywords correctly in the “*recherche*” option. Some students noted the absence in *Automates Intelligents* of a Google-type space to search for keywords as a negative aspect in performing the task: “not knowing how to formulate the exact expression and have *recherche* look for it was a problem for me”. (In fact, *Automates Intelligents* does have a “*recherche*” tool).
- c) Learning styles and ways of navigating are related. For example, in field dependent styles, the information is perceived as a whole (field dependence) and not as consisting of aspects from which those of interest to the specific task can be selected.
- d) The students’ perception of the types of navigation and their actual navigation styles do not always correspond in the learning task performance situation. This may be related to the results of the students’ evaluation of Internet use. They value its role to obtain information but this appreciation is lower when learning and using a foreign language is concerned (cf. Figure 10). Evaluation of the Internet to resolve the task was low or medium.
- e) There is a preference for visually attractive and simple pages that present direct information: “I thought *robotopolis.com* was interesting because of the different types of robots I saw”.
- f) Students find it difficult to recontextualise information and integrate it in new contexts, namely the new text or unit of meaning they had to construct to carry out the task. Half the students claimed that the links dissipated their search, while only 20% reported that they had helped them to understand.
- g) The use of webpages in other languages to obtain information is not a hurdle. Eighty percent of the students handled information from documents in different languages.

The above statements can be completed and formed with other partial data from the case studies, which will be presented in greater detail in a later publication together with an analysis of the students’ navigation maps of the website. We now present some examples that help to illustrate the discussion of the results:

- a) The style with which the student identifies him or herself as an Internet user may not correspond to that which he or she applies when undertaking a learning cybertask:

Case study example: **E.B: A2**. Synthetic, inductive, visual. She would like to improve her capacity to search unknown sites. The foreign language did not represent an added difficulty in

undertaking the task, she regards French language as easy to understand because of its similarity with Spanish, and she frequently uses Internet in other languages. However this student stayed within the context of the page, and did not use the secondary external links offered.

- b) Language level (B1 and B2) facilitates the exploration of pages in active, verbal, synthetic, field independence styles and with a positive tendency towards ICTs:

Case study example: A.A: B1. The student inspected the main page for more than two minutes (127”) for an idea of what she would find. Like most of the students, she entered the first section of the menu, the news section, and remained there for 19”. She then searched the site map to gain an overall picture. From there she went straight to the “arts imaginaires” section where she spent more than one minute before leaving the site and consulting the external page “artbots”. She then went back to the original site and after reviewing various sections for a couple of minutes, she then left the site again and spent 580” reading two dossiers (182” and 231”) on the “SVM Le mag.fr” journal webpage.

This student used the *Automates Intelligents* site as a springboard to search further afield, using the links provided on the page to find out more by consulting eight additional pages (secondary links).

This student’s level of comprehension of the language helped her explore the pages in a few seconds, only spending more time when she wanted to read in depth.

- c) Command of the language is a secondary factor in the degree of satisfaction with the performance and completion of the task among students with low degrees of autonomy who are dependent on external evaluation. Difficulties associated with cognitive, emotional and learning-culture aspects appear to predominate:

Case study examples: P.M B1: Not very autonomous, dependent on external evaluation and emotional, she prefers “the text to be brief and simple so as to avoid eye fatigue”;

S.F. B1: reflective, visual, emotional, and indecisive in her attitude to ICTs, deductive, not very autonomous, dependent on the teacher. She was not happy with pages containing a lot of information and that are not visually attractive. She states that her biggest difficulty was not due to the language, but to a mental block caused by excess information: “Really I felt a bit incapable because I couldn’t see clearly where to find the information. I found a lot of associations, research groups and conferences. Like Marta said, there were too many links and I got a bit lost. But anyway I tried to do the best I could”

- d) For those with autonomous, active and inductive styles, and with a positive attitude to ICTs, language level (A2) is not a hurdle to navigation:

Case study example: MF: A2. Autonomous, emotional, positive attitude to ICTs, active and inductive: “I feel fine! 😊 The only drawback I have seen is that the homepage had so many links and it was a little complicated to find the answers.” He visited some 15 external pages, consulted pages in other languages and chose other ways of accessing information (videos).

- e) Synthetic, inductive and field independent styles with a positive tendency toward ICTs perform the task by moving from browsing mode (5” to 50”) to reading mode in long texts of greater interest to the task:

Case study example: A.A: B1. Looks for the site map where she can get an overall picture of the site and tends to globalise the information and place it in context with other information

- f) In a complex task, the navigating and browsing mode coincides with searches in the page for exact responses to the questions by students with low levels of autonomy and dependent on external evaluation.
- g) Students with an inductive, synthetic, and visual profile, with a certain degree of autonomy, may adopt strategic behaviours to solve the task quickly through emotional reactions and a representation of the task and of the resources, for example a question for which a word-for-word answer must be found in the web resource. In these cases, the navigation style prevails and students express feelings of frustration. Although they manage to answer the questions, their perception of the process is negative:

Case study example: E.B: A2. Synthetic, inductive, visual. Satisfactory solution of the task but reports “it was frustrating not being able to find the exact answers to the questions”

In the chapter on the conclusions of this CIBERTAAAL experience, we discuss and compare the results in the various languages and propose some lines for future research.