THE DESIGN OF ICT MATERIALS FOR THE L2 CLASSROOM: STATE OF THE ART

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Abstract: *Although many European projects stress the use of ICT in language education, research has not focused on the kind of ICT materials devised for the L2 classroom. This work intends to provide a general panorama of the number and quality of the multimedia materials devised for L2 teaching. With some exceptions, it is observed a striking absence of an adequate integration of methodological principles in their design. Generally, this type of materials does not draw insights from disciplines such as foreign language pedagogy, contemporary foreign language theory, cognitive learning theory, or instructional design theory. These results lead us to consider the necessity of a materials-design framework where the main pedagogic principles of some of the following foreign language teaching methods, e.g. Content and Language Integrated Learning (CLIL), Task-Based Language Teaching (TBLT), Focus on Form (FonF), and Computer Assisted Language Learning (CALL) can be complementary and included, and consistently applied, in the design of multimedia materials for the L2 classroom.*

Keywords: Instructional multimedia materials design, State of the art, Computer Assisted Language Learning (CALL), Information and Communication Technologies (ICT), Task-based Language Teaching (TBLT), Content and Language Integrated Learning (CLIL).

Resumen: *Aunque muchos proyectos europeos enfatizan el uso de las TICs en la enseñanza de lenguas, las investigaciones no se han concentrado en el tipo de materiales multimedia diseñados en este campo. En este trabajo intentamos ofrecer el panorama general del número y calidad de los materiales multimedia diseñados para enseñar una lengua extranjera. Entre los resultados de la investigación, destacamos el hecho de que, con algunas excepciones, se observa la falta de una integración adecuada de principios metodológicos propios de disciplinas como la didáctica de la lengua, métodos actuales de enseñanza de lenguas, teoría cognitiva o principios de diseño de materiales educativos. Tales resultados nos hacen conscientes de la necesidad de diseñar un marco para el diseño de este tipo de materiales donde los principales principios pedagógicos de las siguientes métodos de enseñanza de lenguas extranjeras, Aprendizaje integrado de conocimientos curriculares y lengua extranjera (AICLE), Enseñanza de lenguas mediante tareas (ELMT), Enfoque en la forma, y la Enseñanza de lenguas asistida por ordenador (ELAO), se complementen, puedan ser incluidos y consistentemente aplicados en el diseño materiales multimedia para la clase de segundas lenguas.*

Palabras clave: Diseño de materiales didácticos multimedia, estado de la cuestión, Enseñanza de Lenguas Asistida por Ordenador (ELAO), Tecnologías de la Información y Comunicación (TICs), Enseñanza de Lenguas Mediante Tareas (ELMT), Aprendizaje Integrado de Conocimientos Curriculares y Lengua Extranjera (AICLE).

Imitating paper on a computer screen is like tearing the wings off a 747 and using it as a bus on the highway

Theodor Holm Nelson
(Inventor of the term *hypertext*)

The last years have witnessed a growing interest in the implementation of Information and Communication Technologies (ICT) within language education in the European context. Thus, the field of L2 teaching has 'benefited from the increasing number of initiatives or actions prompted by small/large-scale projects on the integration of new technologies in the L2 classroom. The investigation described here attempts to offer a general panorama of the L2 multimedia materials developed in the European-Spanish context. Its scope is narrowed to those multimedia materials

i. developed in the European context and specifically in Spain since the year 2000 (to refine the scope of the survey only materials banks, databases, or resource centres of European, National (Spain), and Regional Official Institutions (Spanish Autonomous Communities) are considered);

ii. implementing a Task-based Language Teaching approach (inquiry-oriented or problem-solving tasks, e.g. webquests or treasure hunts, are taken into account over other types of activities);

iii. that may integrate a Content and Language Integrated Learning framework;

iv. addressing Spanish Secondary (2nd cycle of ESO or Baccalaureate) learners of English as a foreign language;

v. that may be published on the Internet through a website; and

vi. in whose design teachers had some kind of role, either by working individually or in collaboration with other teachers and/or experts.

1. Initiatives at European level
1.1. The Lingua Action in the European Commission

A preliminary analysis tells us that language learning policy of the European Commission is clearly in favour of projects that mainly incorporate new methodology based on foreign language current research and develop innovative materials for foreign language learning. Previously called Lingua Programme (1990-1994), the Lingua Action –one of the eight actions of Socrates, the European Commission programme for education– is concerned with learning and teaching European languages. Specifically, a part of it, Lingua 2, focuses on encouraging innovation in the development of language learning and teaching tools, and on providing a wider variety of language teaching materials to more clearly defined target groups. These materials are included in the so called Lingua Compendia.

Most of them highlight features such as motivation or friendliness as important to attract the learners' attention, and aim to foster the learning of Less Widely Taught European Languages. These materials do not meet all of the criteria relevant specified in our survey, however, all of them are multimedia materials for Secondary students developed for CD-Rom and/or website including some other of our variables.

1.2. The European Label for innovative projects

The European Label is a certificate awarded each year to those innovative projects in Language Teaching and Learning taken place in Europe. It is coordinated by the European Commission but managed by the Member States of the European Union, Iceland and Norway. The Label targets at each level of education and has as its main aims to encourage new initiatives in Language Teaching and Learning, and to raise awareness among teachers and learners of the need to know about these projects and how to adapt them to their particular situations.

The criteria that the initiatives awarded should meet are as follows:[1]

· Be comprehensive (learners, teachers, methods and materials involved should contribute to ensuring that the needs of the learners are identified and met);

· Provide added value in their national context by involving several languages, and particularly those which are less widely used, and the use of an appropriate methodology;

· Provide motivation for learners and/or teachers;

· Be original and creative;

· Have a European dimension by taking into account the reality of the European Union and its linguistic diversity;

· Be transferable to other countries and contexts, languages, and learners' age groups, for example.

Additionally, some projects may include the use of the new technologies although this is not explicitly required.

The projects awarded with the European Label may be consulted at the European Label database[2]. As a result of our query, we obtained 34 initiatives that best follow the key variables of this work. All of these projects are based on the following query selectors:

· Country: All

· Educational Sectors: Secondary

· Themes: Technology-Enhanced Language Learning (TELL)

· Years: 2000-2005

1.3. The European Centre for Modern Languages (ECML)

The promotion of modern languages is one of the main objectives of the Council of Europe's Department of Language Education and Policy[3]. Two of its complementary bodies coordinate the linguistic activity taken place: the Language Policy Division in Strasbourg (France) and the European Centre for Modern languages in Graz (Austria).

The European Centre for Modern Languages promotes innovative approaches and good practice initiatives in the learning and teaching of modern languages. The Centre becomes an international meeting platform for language policy officials, specialists in language teaching methodology, teacher trainers, writers of textbooks and other materials, and other language experts involved in different aspects of Language Teaching. It comprises all levels of education, including vocational training and lifelong learning.

A key part of the Graz Centre is the 4-year medium-term programme of projects that it organises together with international experts in the field of language education. The purposes of the programme are to raise awareness, provide training, and facilitate networks of mutual encouragement and support among teacher trainers and researchers in the field. The current programme, the second one, runs from 2004 to 2007 and is entitled: "Languages for social cohesion: language education in a multilingual and multicultural Europe". It consists of 22 projects to be developed over these for years. They are arranged in four main groups corresponding to the four main topics of the programme: A. Coping with linguistic and social diversity, B. Communication in a multicultural society, C .Professional development and reference tools, and D. Innovative approaches and new technologies. This last group of projects, D. Innovative approaches and new technologies, deserves our attention in the next section.

1.3.1.   D. Innovative Approaches and New Technologies

Relevant to our work are the following projects covered in this group:

Web Journals in Language Education (BLOGS)

A peer-to-peer collaborative writing platform for language learning

Coordination: Mario Camilleri, Malta

Languages: English, French

Main orientation of the project: research and development

Main target group: practitioners at secondary level

Project ECML website: http://www.ecml.at/mtp2/BLOGS

BLOGS website: http://blogs.ecml.at/

General aims:

·   To investigate the use of peer-to-peer collaborative online writing environments within the context of language education.

·   To create a collaborative web platform which allows language students to keep an online journal.

·   To investigate cross-cultural virtual communities of language learners.

Specific objectives:

·   To design and implement a 2nd generation publishing tool that will enable students to publish an online journal without requiring any technical know-how. This publishing tool will incorporate features to promote collaborative writing by enabling students to cross reference their writing with that of other students in the same community, annotating and commenting their and other's writings, and linking to sites of common interest. Class-management and editorial features will also be implemented to enable teachers to monitor and (if so desired) exert editorial control over their students' published writing.

·   To develop a language teaching methodology based on writing and publishing online journals within a cross-cultural collaborative framework.

·   To explore implications of using the technology for students' writing vis-à-vis assessment procedures.

The CLIL Quality Matrix (CLILmatrix)

Achieving good practice in Content and Language Integrated Learning/bilingual education

Coordination: David Marsh, Finland

Languages: English, French

Main orientation of the project: analysis

Main target group: practitioners

Project ECML website: http://www.ecml.at/mtp2/CLILmatrix/

General aims: Production of a web-based CLIL Quality matrix, which shows core quality factors required for successful implementation of teaching and learning through a foreign language. The Matrix would provide insight into:

· CLIL activities in ECML member states

· Reasons why CLIL is introduced

· Good practice case profiles

· Quality factors common across countries and contexts.

Specific objectives:

· The production process will involve collection of case profiles from ECML member states (33 countries), analysis of why CLIL is introduced and how good practice is achieved, and a description of quality factors in matrix form.

LanguageQuests (LQuest)

Task-based second language acquisition with the help of Internet resources

Coordination: Tom Koenraad, Netherlands

Languages: English, French

Main orientation of the project: training

Main target group: material developers, teacher educators

Project ECML website: http://www.ecml.at/mtp2/LQuest

General aims:

· Implementation and dissemination of the LanguageQuest concept

· Improved professional skills for language educators and material developers

· Training of multipliers for the use of LanguageQuest

Specific objectives: After the workshop, participants will be:

· Familiar with the LanguageQuest concept and the underlying SLA principles

· Able to estimate the effect of a LanguageQuest on SLA

· Able to improve existing LanguageQuest in terms of better SLA outcomes

· Able to design and construct an effective LanguageQuest and

· Prepared to disseminate their acquired insights and competence in their home countries

2. Initiatives at National Level
2.1. Centro Nacional de Información y Comunicación Educativa (CNICE)

The CNICE[4] (Centro Nacional de Información y Comunicación Educativa), formerly known as PNTIC (Programa de Nuevas Tecnologías de la Información y de la Comunicación), is the Information and Communications Technology centre for education funded by the Spanish Ministry of Education and Science. It partakes in the European Schoolnet[5], the international framework supported by the European Commission, consisting of more than 26 European Ministries of Education developing and sharing knowledge on the use of ICT in education.

The CNICE provides the different areas of education at any level with ICT resources of different kinds, e.g. software tools, multimedia materials, related websites, and projects, among others. Regarding multimedia materials for the Foreign Language Teaching, we highlight two sections of this centre: First, the MALTED system (Multimedia Authoring for Language Tutors and Educational Development), and CNICE Awards.

2.1.1. MALTED

MALTED[1] (Multimedia Authoring for Language Tutors and Educational Development) is an EC funded project that aims at providing storage of multimedia materials as well as an authoring software tool for language teachers to develop their own materials. It was co-financed by the EU Telematics Applications programmes Socrates and Leonardo da Vinci, based on educators and programmers' experiences in the UK (UCL Language Centre and Department of Computer Science), Spain (Ministry of Education and the Sema Group), France (France Telecom, ENST and CYCNOS) and Ireland (Capture Productions Ltd.).[2] The system consists of four components: The Runtime System (RTS), the Developer Tool (DVE), and the Learning Management System (LMS), and the Asset Base, The description of each of them is as follows:[6]

1. The *Runtime System (RTS)* is a program that allows learners to follow language courses and perform specific language exercises. There are two versions, the stand alone Runtime System – RTS and the Web version (MALTED Applet), which can be embedded in Web pages and used through the Internet.
2. The *Developer Tool (DVE)* is a sophisticated program for tutors and authors to create exercises and courses. Tutors can take advantage of re-using/adapting existing exercises or use the program to create entirely new material.
3. The *Learning Management System (LMS)* is a program that registers students' performance. It launches the RTS and receives information from it. The teacher can monitor the students using the information provided by the LMS
4. The *Asset Base* is at the core of this solution, and provides storage and retrieval facilities for the management of multimedia assets and their associated metadata (e.g. labelling a course regarding target learner group, language, level, skills etc.). It can be accessed by tutors and students alike.

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[1] MALTED website: http://www.cnice.mecd.es/malted/
[2] Source: http://www.malted.com/about.htm

The Spanish MALTED website offers downloadable materials for teaching English as a foreign language in Secondary and Baccalaureate levels of education. Each of these materials share the same structure: Task, Glossary, and Help. Initially it seems that a problem-solving philosophy is applied in the material, conversely we cannot talk of tasks but of traditional activities found in any L2 textbook. The difference may lie in that MALTED materials incorporate some basic features of computer technology, such as in-built sounds or movement. Hence, in our view, they do not exploit very useful resources provided by ICT implementation.

4.1.1. CNICE Awards

Since 1999, the Spanish Ministry of Education and Science organises the CNICE Awards, a yearly competition aimed at awarding good educational ICT materials produced by not for profit organisations, private individuals, and private or public schools. In this last case, the materials should be created by a team of teachers working in collaboration with students. The materials can be presented on CD-ROM and a requirement is that they may be publishable on a website. The topic of each material corresponds with contents of an existing subject in the current Spanish educational curriculum.

Arranged by subject, level, and awards year, the awarded materials are showcased on the following website: http://www.cnice.mecd.es/programa/premiosmat.htm.[7] As regards materials for teaching English as a foreign language, the following materials are surveyed: *English for Little Children*, *Interactive English*, *Say it*, and *Gasnmartín.net*.

Let us focus on the last three materials since they cover the learners' level considered in our work, Compulsory Secondary Education (ESO). The first material addresses Infant and 1st cycle of Primary Education. These are their data sets:

Interactive English

Author: Aurora Gil Pou

Level: ESO, 2nd cycle

Year: 2001

Reason for the award: "Por aprovechar los diferentes enfoques que permiten las TIC para apoyar el trabajo académico en el aula ya que potencia la actitud activa y crítica del alumno" (BOE, Nº 293, 2001: p. 45534)

Website: http://www.cnice.mecd.es/eos/MaterialesEducativos/mem2001/ienglish/index.html

To draw the learners' attention, the material is designed in an aggressive design in black, blue, and green colours. The site is made in Flash, what allows the use of movement and sounds throughout the different parts of the menu. The menu is divided into 3 parts or levels: Easy (third ESO), Intermediate (fourth ESO), and Advanced (Baccalaureate). There is a fourth part called *Issues* for advanced learners which include activities based on contemporary topics such as child labour, eating disorders, domestic violence, global warming, female genital mutilation, and immigration. The first three levels are further organised around a grammar part and a games section. Each of this level is developed through activities of a different kind, e.g. true-false, comparison, matching, etc. At the end of each activity or set of activities a final score is provided.

Say it

Author: Ana Yagüe Ena

Level: ESO, 2nd cycle, and Baccalaurate

Year: 001

Reason for the award: "Porque permite practicar destrezas orales de la lengua inglesa de una manera organizada y facilita la interacción de los alumnos" (BOE, Nº 293, 2001: p. 45534)

Website: http://www.cnice.mecd.es/eos/MaterialesEducativos/mem2001/sayit/index.htm

Say it is composed of three units: *Case study* (A Summer in the State of New York), *Roleplay* (A Detective in New York), and *NY Quiz* (The Big Quiz). These units are organised around listening activities which contain samples of native-like speech. Each of the unit is planned as a challenge for the learner, who becomes the protagonist of an adventure with a final compensation, as the following *NY Quiz* Instructions:

This quiz has 3 levels with 20 questions each. All the information needed in order to answer them is covered in the section Information about New York.
At the end of each level, you can collect your prize and stop or go on to the next level to try and get the final prize. But if you don't pass the next level you'll lose everything.
In order to pass a level you must answer all the questions right.
http://www.cnice.mecd.es/eos/MaterialesEducativos/mem2001/sayit/quizinst.htm

Gasnmartín.net materiales

Author: Mª Jesús García San Martín.

Level: ESO, 2nd cycle

Year: 2001

Reason for the award: "Por su valor como recurso didáctico tanto en el trabajo individual como en el colectivo de aprendizaje del idioma inglés" (BOE, Nº 293, 2001: p. 45535)

Website: http://www.cnice.mecd.es/eos/MaterialesEducativos/mem2001/ingles/index.html

This material shows an eye-catching entry made with Flash software but without *skip intro* link, what delays the learner's access to the information behind. The material is arranged into five levels corresponding to those defined by the Escuela Oficial de Idiomas. Each level comprises a great number of activities easily recognized by the teacher of English. Thus, we find word buildings, cloze tests, quizzes, wordsearchs, multiple choice, matching exercises, or crosswords, among others. The difference with a non-CALL environment lies in the resources used to present each activity. All of them are designed in Flash. This allows to including movement, sounds or any other required feature in each activity. As an example, a linguistic element may move to the right position in a sentence catching the learner's attention towards it.

These materials are correct samples of ICT implementation in the field of Foreign Language Teaching. They make use of basic computer resources such as self-check tests with instant feedback, sound integration, movement, or colour change to highlight a specific linguistic item in a sentence. They are acceptable samples of how the computer may expand the traditional ways in which a given content part may be exposed to the learner. However, in our opinion, much more could be done in order to further integrate both fields.

Through an Internet connection the learner may have access to authentic pieces of the foreign language in written and aural forms. Internet becomes a world of its own to be explored in the Foreign Language classroom. Being a requisite of the CNICE materials that they may be published on the Internet, yet they really miss this potential by making a poor use of web resources. Hyperlinks, for instance, are doors to the information hosted in the cyberworld, and, as such, they become a powerful resource for bringing authentic language to the classroom. However, only two of the three materials include a link to an online dictionary (*Say it*, link to Merriam Webster Dictionary[8], and *Interactive English*, link to Dictionary.com[9]). No other hyperlinks to different websites are included. Similarly, these materials neither incorporate any medium of synchronous communications (audio video chats, e.g. MSN Messenger) nor asynchronous communications (E-mail exchange).

An interesting way to tapping the potential of the Internet resources in the Foreign Language classroom is to devise more challenging tasks, requiring a higher involvement on the learner's part. Except for the material *Say it*, which launches a kind of challenge in each of its activities, the rest are independent activities, i.e. with a beginning and an end in themselves, without other purpose than the one shared by traditional language activities, i.e. fill in the blanks, matching phrases, or transforming a sentence, among others. No problem-solving activities, such as a webquest, are proposed. Webquests are meaningful, goal-oriented activities which require electronic resources such as the Internet, or even non-electronic resources such as books, magazines and any other printed material to be solved. Collaborative work would be another feature of this kind of activities, something which is not present in the CNICE materials.

Yet, a point that should be stressed in the CNICE competition is that it encourages teachers' contribution to ICT materials design. Awarding the instructors' interest and involvement in this task couples with the recommendations done at the European level through official documents.

5. Initiatives at Regional Level

The Spanish Autonomous Communities are also sensitive to the educational possibilities offered by the technological advances. There exist, however, differences among them as regards the degree of development in this field. One of the reasons for these differences could be the different moments in which the transference of competences in educational matters from the central State took place. However, despite this fact, all of the communities are strongly supported by the State in three ways:

1. The development of adequate technology infrastructures for each school centre, e.g. computers, access to the Internet, and others;
2. Provision and periodical renewal of information and technology resources, e.g. hardware, software, instructional materials, or forums, among others;
3. and teacher training in the use of Information and Communications Technology. [10]

With reference to the first point, La Rioja is one of the communities most concerned with pedagogical and technological innovation in education. The ENTER action, within the Programa Riojano de Acciones Innovadoras (PRAI)[11], covers the project *La pizarra digital*[12], thanks to which the school centres are endowed with interactive or digital whiteboards requiring a computer and a digital projector to capture writing electronically. The ENTER action also prompts teacher training in ICT. In addition, in this community the rural school, called CRAs (Centros Rurales Agrupados), is benefited from the CNICE program *Aldea Digital*, also aiming at introducing new technologies in the classroom.

Following we include a series of the most relevant L2 materials drawn across the portals of the Departments of Education of the different communities. All of them are webquests or treasure hunts-like materials:

- Andalucía:

The Castle Quest
ESO
http://www.juntadeandalucia.es/averroes/recursos_informaticos/andared01/castlequest/

- Aragón:

Itinerario por Escocia
Baccalaureate
http://www.educa.aragob.es/ryc/wq/viajescocia/index.htm

- Baleares:

Sightseeing London
ESO
http://weib.caib.es/Recursos/london_webquest/index.htm

Do you know him?
ESO
http://weib.caib.es/Recursos/shakespeare_webquest/shakespeare/index.html

- Cataluña:
The Resource Centre for Foreign Languages (CRLE) of the Department of Education of
the Generalitat of Catalunya

Off to Oz
2nd Cycle ESO and Baccalaureate
http://www.xtec.es/crle/02/webquests/english/3index2.html

How to Be a Responsible Consumer
2nd Cycle ESO and Baccalaureate
http://www.xtec.es/crle/02/webquests/english/2index2.html

What a Statue!
2nd Cycle ESO
http://www.xtec.es/crle/02/my_statue/

We Like What We Are Like
1st Cycle ESO
http://www.xtec.es/crle/02/teatrea/index.htm

Philadelphia
2nd Cycle ESO
http://www.xtec.es/crle/02/philadel/index.htm

In Love with Shakespeare
Baccalaureate
http://www.xtec.es/aulanet/ud/angles/love/index.html

Mystery in the Middle Ages
2nd Cycle ESO
http://www.xtec.es/crle/02/middle_ages/index.htm

Accessible Environments

Third ESO
http://www.xtec.es/crle/02/barriers/

In our opinion, *Accessible Environments*[13] is one of the best multimedia materials for the teaching of English as a foreign language. It makes compatible the L2 pedagogy (interesting problem-solving tasks, collaborative and aware-raising webquests about physical and social barriers) with the use of new technologies (integration of web resources in the tasks) in an excellent way. Likewise, the material is superbly presented: its interface is tastefully designed, and information is easily accessed through intuitive navigation patterns. For these reasons *Accessible Environments* becomes a useful reference for the design of our own material.

Conclusion

The present state of the art provides some clues of the activities carried out in the field of L2 teaching regarding ICT implementation. Echoing the European advices, the Spanish Ministry of Education and Science have also taken steps towards triggering actions in this field through the CNICE. However, the survey reveals that recommendations at official level sometimes do not always result in the production of good quality instructional materials.

With some exceptions, the materials listed above do not harness the computer and Internet's potential at all. They are limited to imitating paper on a computer screen, therefore, failing to understand the true meaning of Theodor Holm Nelson's opening quotation of this chapter: "Imitating paper on a computer screen is like tearing the wings off a 747 and using it as a bus on the highway". There is no point in mirroring the textbook's organization and layout on the screen. A wide range of options, different from those offered by the textbook, are made accessible through the use of the computer.

Ineffective use of computers is the resulting action of failure in at least the following aspects: Lack or misunderstanding in the application of good pedagogical principles of L2 teaching in the design of the material; unfamiliarity with ICT in general, i.e. training in computers' management, or authoring software, among others; and lack of knowledge in the use of ICT in Language education in particular. Care needs to be taken that future initiatives favour teachers' training and further implication in this regard.

These results lead us to think about the need to devise a materials-design framework where the main pedagogic principles of most, if not all, of the following foreign language teaching methods, i.e. Content and Language Integrated Learning (CLIL), Task-Based Language Teaching (TBLT), Focus on Form (FonF), and Computer Assisted Language Learning (CALL) are complementary and can be included, and consistently applied, in the design of an original multimedia material for L2 learners.

Notes

[1] Source: Report on the implementation of the European Label for innovative projects in language teaching and learning 1999-2001.
http://europa.eu.int/comm/education/policies/lang/awareness/report_1999-2001_en.pdf
[2] http://europa.eu.int/comm/education/language/label/index.cfm
[3] http://www.coe.int/T/E/Cultural_Co-operation/education/Languages/
[4] CNICE website: http://www.cnice.mecd.es/
[5] European Schoolnet website: http://www.eun.org/
[6] Source: http://www.malted.com/components.htm
[7] At European level, there exists the *eLearning Awards*. Like CNICE Awards, these prizes award examples of good and original use of ICT in learning. They target at schools, educational institutions and organizations in Europe carrying out primary, secondary or teacher training education, and teachers

employed or working for such schools, educational institutions, and organisations. http://elearningawards.eun.org/.

[8] http://www.m-w.com.

[9] http://dictionary.reference.com.

[10] *Actividades y proyectos de las Consejerías de Educación de las Comunidades Autónomas* (I Congreso Internacional Educared) http://www.educared.net/htm/congreso-i/documentacio/txtccaa.htm.

[11] PRAI website: http://www.larioja.org/prai/index.htm.

[12] *La pizarra digital* website: http://dewey.uab.es/pmarques/pizarra.htm.

[13] This project has been successfully carried out in a in a third year ESO class of twenty one students of the IES La Serreta (Rubí, Barcelona) during a Crèdit d'Ampliació d'Anglès. The results of the project's implementation are found in http://www.xtec.net/crle/02/barriers_st/.