

WRITING ON THE WEB: A WEB APPLIANCE IN A UBIQUITOUS E-LEARNING ENVIRONMENT

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ABSTRACT

Surfing the Web basically consists of reading webpages. However, the Web is becoming more interactive and its use as a writing platform is currently attracting increasing attention. The nature of Information and Communication Technologies provides an ideal framework for language learning, since its main entity is information and its purpose is communication. We present a writing appliance designed for teaching languages called AULA (A Ubiquitous Language Appliance). By establishing an infrastructure of Ubiquitous Computing applied to education, we create a pedagogically-grounded and technologically-enhanced environment which enables writing in collaboration anywhere (including any classroom) anytime. Taking advantage of portable computing, wireless connectivity and Web technologies, the AULA appliance makes information and communication tools accessible to students in a pervasive way. Thus, the traditional classroom evolves to an apparently not very different eLearning environment. Rather than providing content, AULA provides the learner with the capacity to write online. They can negotiate collaboration and also access content. The teacher guides the process and evaluates the results. Based on the writing process and on scenario-based learning, the AULA system integrates and adapts the ICT components into the learning environment. Language learning is enhanced through technology with interactive dynamic functionalities for writing on the Web.

INTRODUCTION

In the current Information Society, technology provides access to information resources and communication tools. The integration of the three ICT components (information, communication and technology) in an appropriate language learning environment offers the opportunity to create authentic interactive situations for learning a language.

Many governments and institutions are promoting incorporating ICT to education, paying attention not only to the skills necessary to make use of the technology but also to adapt the language skills to the new learning situation. While the USA Department of Education is more involved in the provision of adaptive technology, Europe seems to give more prominence to methodology. In fact, the governments of the European Community have committed themselves “to agree a European framework defining new basic skills (including IT skills, foreign languages, technological culture, entrepreneurship and social skills) to be

provided through lifelong learning” (European Commission, 2002). The ability to understand and communicate in other languages is a basic skill for all European citizens. The eLearning European Initiative fosters the active use of language as Interaction in learning (Common European Framework of Reference - 2001). This interaction is seen as communication to work in group (collaboration), and learning is seen as socialization through language by means of which we internalize knowledge (Vygotsky, 1978). In order to achieve this, the EU recommends the use of the ICT to support language learning.

Thus, both language learning and Information and Communication Technologies are considered of primary importance in the development of the Information Society. The nature of the ICT, of the Web in particular, offers an ideal framework for language learning, since both, language & the Web, deal with the same entity, information, and their purpose is communication. However, although much literature on the field refers to ICT, few tools or systems take into account the three components in an integrating way. Students commonly use vendor-specific word processors, email applications and CD-Rom contents separately. Currently, the World Wide Web facilitates this integration as an educational tool. Nevertheless, most online language learning tools consist of providing access to browsable information-centred content (EFL and ESL sites with exercises which the students browse and at most use form buttons to interact with the content). Some are communication tools, such as webmail for learning (ePals.com) or for delivering assignments in most distance learning courses. Most technology issues ‘merely’ deal with the provision of an Internet connection and some desktop PCs in a computer lab. Our proposal, the AULA system, aims to integrate the three components in an eLearning environment. We have applied it to the writing skill, adding pedagogical foundations grounded on the three concepts: the writing product (information-based), the writing process (technique-based collaboration with communication between learners) together with the writing task (scenario-based learning (Kindley, 2002) with communication between teacher and learners). The underlying infrastructure is based on wireless technology enhanced with ubiquitous computing (Weiser, 1990) which allows taking portable computing devices (PDA, TablePC, Portable PC) to any traditional classroom, converting it into a ubiquitous TELL classroom, accessible anywhere at any time with the aim of communicating synchronously and asynchronously by writing in collaboration on the Web.

In this paper we start by presenting the evolution from the traditional classroom to CALL environments to the ubiquitous technology-enhanced classroom. We describe the technology involved and the way the language skills and activities are influenced. Then, a description of the writing activity in a TELL environment, the scenario in context and the tools available for the writing process and for the final assessment will follow. We will end with a comment on the scenarios done and published and the ones currently at work, and the conclusions drawn.

THE EVOLUTION OF THE LEARNING ENVIRONMENT

The Traditional Classroom

Conventional language learning environments offer limited access to information inside the classroom. Language students – and teachers, too – make use of textbooks, the blackboard, pen and paper, which they seldom use outside the classroom. Considering the really active language skills, i.e. the productive skills of speaking and writing, the conventional environment of the classroom seems quite appropriate for speaking since we

practise pair work and roleplay mainly in conversations, in face-to-face communication. However, interactive communication is neglected when practising writing. Students mainly write with an active communicative purpose only when they do exams. Rarely do they write true letters or texts for a specific audience. The writing classroom requires more interactive techniques than the ones offered in the conventional learning environments.

The Call Environment

In the last decades the tendency to apply Computer-assisted language learning (CALL) has focused on adapting language learning activities to the computer (Chapelle, 1994). CALL has contributed with providing greater access to information. CALL's main function and achievement have been to deliver a large amount of content, first in CDROMs, and now accessible on the Web. Accessibility was the main point. For that purpose, CALL classrooms were filled up with desktop PCs. Printed materials became digitized, but those drill and practice materials were still based upon repetition techniques. Its use mainly focused on exam-based activities. The students only interact with the computer. There is no communication in writing and speaking in the classroom in real time, and students work in isolation, focusing their attention onto the computer screen. The integration of computers in the traditional classroom has been difficult. The computing components used in the classroom (mainly Desktop PCs) seem to hinder the learning activity. The separation of these two worlds is critical: the computer and the rest of the classroom (Ortega, 2001).

More recent trends are the use of Learning Management Systems (LMS) such as Blackboard and WebCT. These systems help the teacher and the learners with a repository of resources and contents, specific for a particular distance learning community. They are really helpful for distance learning and provide the students with some communication facilities via chats, discussion forums and email, but they do not incorporate any specific technique or process for learning a particular skill. They take advantage of the attractive motivation that learning with computers involves, but they neglect the use of the authentic communicative facility computers can provide, mainly when we write. CALL instruction was a reflection of the language materials in digital support, but its provision was not accompanied by the principles of the current methodology: the communicative approach. More recently, the new technologies have supported more communicative strategies, providing practice to develop the language skills, mainly the receptive skills, Reading and Listening. These strategies are the base of the so-called Communities of Practice, such as the European SchoolNet, and MyLearningPlace, two platforms which allow participants to communicate and meet in a common learning objective. But, although providing email, chat and discussion list/forum communication, these two platforms lack a fully integrated writing facility.

The Ubiquitous TELL Environment

A more integrating environment is required where the students can interact whether in the classroom or outside the classroom. They will be able to access information, which they can share, and communicate synchronously or asynchronously by writing from anywhere and speaking face to face when they are in the classroom where they will draw their attention from time to time to the teacher and to the blackboard. The classroom should then be enhanced with technological devices, providing the traditional elements (the blackboard, the notebooks) with computing capacities (Ortega, 2001). It is the Ubiquitous TELL Classroom. We propose TELL (Technology-Enhanced Language Learning) as an elearning environment enhancing language communication and, hence, language learning. With TELL, the elearning

environment is not just a system providing content (learning objects) but a real mechanism (a learning functionality or service) which enables the real use of language and ICT tools to communicate and have access to information, meeting the new needs and possibilities of the Information Society.

TELL environments are not an essential element to support the learning activity themselves (Warschauer, 1997) as CALL environments are where computers technologically support the language learning process, but they improve learning by providing further capabilities. Since there is a tradition in the learning mechanism based on the conventional classroom with a teacher, a blackboard, books, pen and paper, TELL allows adapting the traditional classroom without apparently much change, thus making the traditional learning advantages coexist with more innovative improvements. The enhancement proposed here consists in the deployment of the ubiquitous paradigm. The emergence of “ubiquitous computing” (Weiser, 1990) with small computational devices, wirelessly interconnected and connected to the Internet, working as electronic notebooks and interactive whiteboards will finally enable the technologically enhanced classroom by making the computer ‘disappear’, unnoticeably pervading in the learning environment. The paradigm of ubiquitous computing allows us to break down the borderline fading the computational environment into the classroom. In this way, the students interact with the system without really being aware. They are in their natural scenario where they interact: a classroom with classmates, the whiteboard and the teacher. Is there a better scenario than the real classroom enhanced with the use of the latest writing tool (the computer as a notebook), with access to the largest source of information (the Internet), and at the same time with authentic communication tools (a chat facility)?

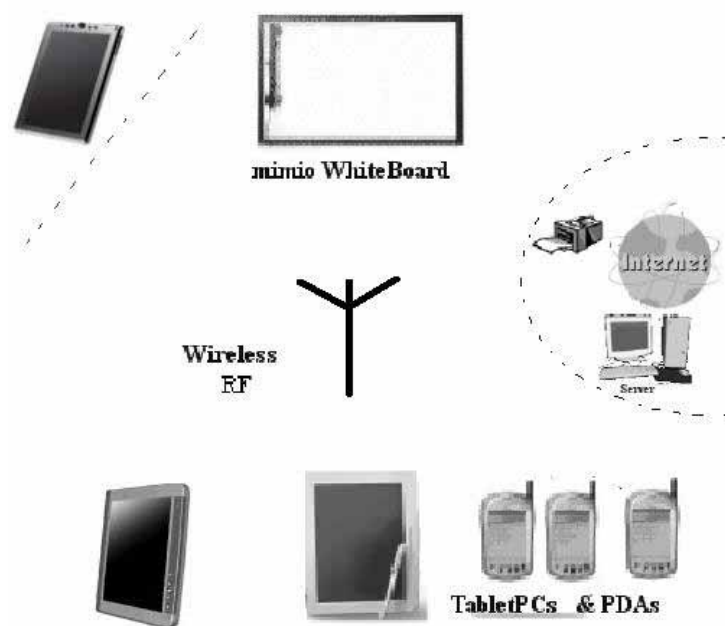


Figure 1. The Ubiquitous TELL Environment with AULA

This environment enables communication from anywhere (the so-called Mobile Learning – M-Learning), communication both in real time and at any time and pervasive access to the system, to information and to ICT tools, without distorting the students’ attention and abilities. With Ubiquitous TELL we can provide a seamless conjunction between the world of the classroom, the electronic communication devices and the Web, the largest resource of information. Learning is then achieved by communicating easily and

actively anywhere anytime, taking advantage of the electronic resources for learning with access to information and communication facilities.

AULA is a ubiquitous TELL system based on the active use of language for communication, providing real Web-based tools to access information (e-Accessibility) and integration of ICT and language tools to communicate. Elearning resources are now part of the learning, not just a translation of conventional learning methods into an electronic form.

WRITING AS A LEARNING ACTIVITY

In the traditional language classroom, the writing activity has been used mainly as a means of evaluating the students' lexico-grammatical competence, a technique for individualized assessment, where the student is isolated, without access to information and unable to communicate with other students. Additionally, most Web-based language learning activities are developed to improve the skills of reading and listening. Grammar-focused activities are the most frequent contents in language learning. This does not reflect the current application of writing in the real world, where when we write formally we use technologically enhanced devices, we have access to information and we write to communicate, making use of communication tools. We can extrapolate this situation to the world of work, where it is necessary to write reports frequently collaborating with members of other departments (e.g. Doheny-Farina, 1986, referenced in Murray, 1992; Koch, 1995). Vygotsky (1978) considered that learning should be closer to socialization, where an individual internalizes language by collaborating in common activities and by sharing the means of communicating information.

The writing facility is essential in the communication provided by the Internet. So there are several procedures for writing but they have not been designed to learn the writing skill. The email uses the Internet technology for one-to-one communication through writing. A few email systems have a language learning objective, but they do not follow a pedagogical theory. The same applies to Discussion lists, Bulletin Boards or Forums, which also facilitate communication through writing.

Since its inception the Web has been seen as a Reading Platform, whose content was written by skilled webmasters who use webpage edition techniques (mainly DHTML coding) and who are rarely the authors of the text they edit. Easier edition techniques (closer to simple text edition or word processing) have appeared facilitating the edition of text on a page by writers who are not specialists on HTML programming code. Blogs allow users to edit their own pages in a diary-like format with opinions or comments on current facts. Wikis allow anybody to easily create, edit or modify any Webpage in the system, thus being an effective tool for writing in collaboration on the Web. And placing materials on the Web makes writing something purposeful and meaningful. The learners can write authentic materials for a real audience.

Communication In Collaboration

The Web is a part of the Internet that allows not only access to information by browsing, but also interaction through communication. Very often we access communication tools from outside the Web: email, chat and discussion lists. However, the Web has its own interactive capacity for communication. We frequently use the Web for browsing content, but it also allows interaction by writing in forms to communicate with the server. The Web gives learners opportunities for collaboration that conventional learning environments cannot

otherwise afford to provide, and certainly not with the accessibility (anywhere anytime) and the procedures necessary (the same document to share and work with).

Based on the Wiki philosophy, we have developed a Web-based writing system with a learning foundation, to practise the writing skill by writing on the Web: the Web as a Writing platform for all the users of the system. Texts can be written both individually or collaboratively and integrated in a language learning task assigned by a teacher.

TELL eLearning interaction relies on Web-based tools for access to information and communication. AULA's main feature is this TELL interaction. Consequently, it allows ICT and language integration in a holistic methodology for learning the skill of writing:

- Writing for Communication in Collaboration (the product and the technique): "Writing on the Web"
- Writing to Communicate (the task in context: the scenario)
- Writing as Communication (the writing process)

The AULA system includes a web-based chat facility incorporated in the learning environment, which can be accessible in a synchronous way (the proper chat activity) as well as in an asynchronous way (providing the facility similar to discussion lists). Apart from interactive forms, web pages can be converted in writing surfaces that will update the information on the webpage we are handling. AULA deploys two underlying CGI-based technologies, the WikiWay and Blogging. This way, AULA allows real language skill-based collaboration. Writing in the real world is not a solitary act, but a result of interaction between a group of people (information providers, editors, and reviewers), the context and the text itself (Murray, 1992).

Some collaborative editing systems have been developed, though they are usually complex and lack flexibility, the full ubiquitous capacity or the learning foundation and objective that AULA offers. IRIS (Koch, 1995), Duplex (Pacull, 1994) and Classroom 2000 (Abowd, 1999) deserve mention.

The Writing Scenario

The writing activity should take into consideration how the group collaborates to produce a written text in a specific scenario. Accordingly, collaborative strategies should be established depending on the scenario and defined by the teacher when giving the students guidance for accomplishing the writing activity. AULA offers this facility in the Assignment column, which also gives guidance of the writing process.

TravelBrochure2 Writing Assignment	NewTechnologies Writing Assignment
<ul style="list-style-type: none"> · Write texts in collaboration about a town or a tourist resort you know well. · Type: Collaborative · Level: PreIntermediate · Class: 2nd Course · School: EOI CR (Spain) · Instructions: 3 paragraphs. · First, identify & write descriptions reinforced with emphasizing adjectives. · Then, things you can do there, activities, ... · Finally, positive predictions about enjoying the visit. 	<ul style="list-style-type: none"> · <u>English Writing</u> · There are some activities to do (writing help, grammar & exercises) at English 4 U5 Theory&Practice or you can see our Resources for Writing · Write a text explaining one of the New Technologies. Then, compose one in collaboration supplying one or two of your main ideas. · InsideOut, Unit5-Digital- (Adapted) · <u>Suggested topics:</u> · - Mobile Phones · - World Wide Web

Figure 2. Two Scenario Assignments

The AULA system has been developed within the scenario-based learning frame (Kindley, 2002), implemented with online collaboration and communication tools, which allow developing the writing skill with the objective of achieving authentic tasks: with a purpose, for an audience, in a possibly real context. Real experiences and real work situations can suggest appropriate contexts for the teachers to provide writing assignments. The system offers the students access to information on the Internet about the topic or other content provided by the teacher as links in the Assignment column.

The Writing Process

In order to achieve the writing of an appropriate text according to formal written standards, some guidelines on the process of writing to follow should be given by the teacher in the Assignment column. The teacher establishes this Scenario (e.g., a online newspaper, a travel brochure, films reviews, etc.), determining the conditions and pointing out the features of collaborative writings. The students have them at hand at every moment during the writing activity and thus are permanently aware of the technique to follow. They propose titles within the scenario and create the documents, to be written whether individually or in group, as indicated by the teacher.

Then the writing activity may be developed following any kind of writing process, from *freewriting*, where everybody contributes with draft paragraphs that can be collaboratively corrected and improved by any classmate after negotiation through the chat facility, to structured schema-based writing, staged in three phases: *Planning*, starting with a 'brainstorming' session on the topic, proposing ideas in an outline; *Development*, selecting and organizing the most appropriate ideas and aspects through a chat-based discussion process, and developing the ideas into draft sentences and paragraphs with the aid of the language tools available (the AULA English dictionary with 4000 entries, a lexicon based on the AULA English dictionary, the WordNet database, among others); and *Editing*, transforming the draft text into grammatically correct sentences and coherent paragraphs with the appropriate vocabulary and style. In this stage the text is revised in collaboration. If there are no specific roles as reviewers assigned in the group, any student can access the document and propose modifications through the chat facility. In their electronic notebooks, the students write their contributions and propose them to the group, negotiating corrections and the final decisions on the chat. The students can also add images to their text, in an easy way. A button to the images search facility in Google provides the students with a multimedia

improvement for their documents. They just copy the URL address of the chosen image into the document and the Reading Workspace will show the image accordingly (Figure 3).

Finally, on the deadline established, the students agree on the definite state of the document. Once the teacher has evaluated it, they will see the Corrected Version online.

The screenshot shows a web application interface for 'The AULA NewTechnologies Scenario'. The main content area is titled 'Mobile Phone9' and contains text about mobile phones, including notes and a paragraph. To the left is a sidebar with 'Aula' logo, 'Your UserID:' field, and buttons for 'Edit to Write', 'New idea!', 'Log in', and 'WhiteBoard'. To the right is a 'NewTechnologies Writing Assignment' section with a list of activities and suggested topics. The interface includes a top navigation bar with icons for Home, Scene, List, New, Search, Print, Language Tools, Chat, and Help, and a copyright notice for Pedro P. Sanchez Mallon.

Figure 3. The Reading Workspace: Notes development into text (centre), buttons (left) for access to the Writing Workspace, and Scenario Assignment (right)

Assessment

The system has a tracking facility which helps the teacher in the individual assessment of every student's participation. Every student's actions are recorded on a trace file, which the teacher can analyse in a table showing the different contributions made to the document, the time and the user's name or identity. The analysis of the chat file also helps in this activity. From the teacher's Editing Workspace (Figure 4), the assignment can be modified at any moment during the writing process. Here the teacher has the capacity to make the final corrections and save the corrected version of the document in a different file, whose link is displayed and accessible from the Listing Scenario page. The link to the corrected version appears in red, and so do the corrections, as usual.



Figure 4. The Teacher's Edition Workspace

The teacher's Edition Workspace is similar to the students' Writing Workspace, differing mainly in the possibility to modify the Assignment column on the right and in the options of the left column. This column also includes a button to check for plagiarism, i.e., the possibility of cheating. Since the system provides (and recommends) the students' access to the Web, they might copy chunks of texts which the teacher can guess are not their own.

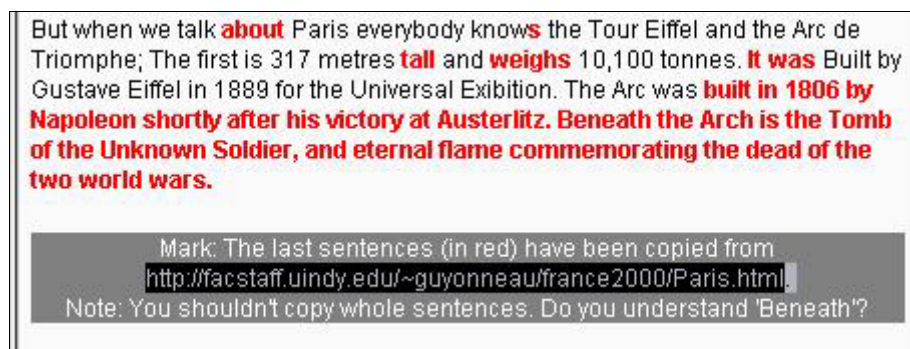


Figure 5. The Corrected Version of a Document, with cheating checked and found.

AULA Writing Scenarios

The AULA system is currently being used at the Escuela Oficial de Idiomas de Ciudad Real in Spain, a Further Education Centre specialized in teaching foreign languages. The students were first assigned to write an online newspaper for the English Language class. They were over 18-year-old Spanish students with an elementary knowledge of the English language. The writing activities took about three 50-minute sessions on average. Some could not attend one or two sessions; however, they continued contributing and revising from their homes or their university or workplace. They wrote seven articles, and their participation ranged from one to five (1-5) articles, making proposals (1-4) and corrections (1-4).

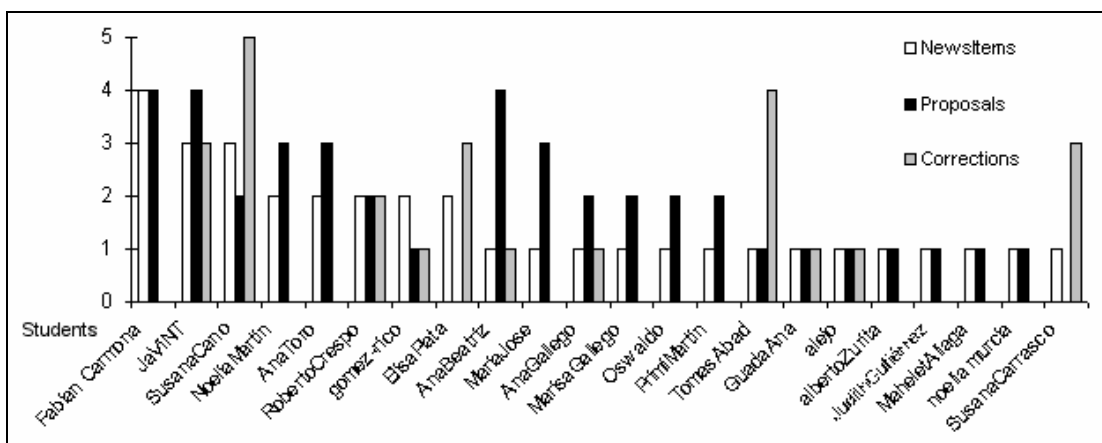


Figure 6. The Students' Participation in the Online Newspaper

Other assignments followed, easily adapted from writing activities on paper in the textbooks. These are the following: A Travel Brochure (7 documents) and New Technologies (16 documents, a mixture of individual and collaborative writing). It has also been used for individual writing assignments, which because of their quality of dealing with personal information were not adequate as topics for collaborative writing. These dealt with Treasured Possessions and Film Reviews. The system proved quite efficient and equally motivating when used for individual writing. The students spent one session less than when collaborating, since there is no chatting and they are more accustomed to writing individually.



Figure 7. Opening Page of the AULA System with a List of the Scenarios

CONCLUSIONS

A Technology-Enhanced Language Learning (TELL) environment, with 'real-world' computing devices and tools to access information and to communicate synchronously and asynchronously in a pervasive way, provides the most appropriate learning interaction. The conventional learning environment evolves to a ubiquitous elearning scenario which fades the classroom world and the real world by means of computational features. We have implemented such an environment in the AULA system, a ubiquitous collaborative elearning environment for the learning of collaborative writing as an active skill which offers the opportunities for authentic, scenario-based communicative language activities. It allows establishing writing scenarios where ideas are shared, access to information is provided and electronic communication and edition tools are used. It integrates technology-enhanced communication, information search and language tools to help the students write naturally in a collaborative way, making these tools permanently accessible to them in a pervasive way.

The teacher establishes the scenario as a writing task in a possibly real context, where the students develop their writing skill by following a writing process, from the brainstorming phase to the final draft phase. The system also provides a tracking facility which helps the teacher in the individual assessment of every student's participation and helps in the edition of the corrected version.

The current implementation of AULA is targeted at learners of English as a Foreign/Second Language (EFL/ESL), but it is being adapted to the learning of other European languages – Spanish and German in the first instance. We are also currently improving the teacher's assessment tools and implementing the capacity for the teacher to customize the scenarios proposed and the possibility to easily publish them on the Web after task completion, thus providing more authentic context for writing. The integration of a password protected learning management system based on Blogs is also scheduled for the next months. This will enhance the teachers control on this TELL environment.

The texts written remain as webpages. This authentic writing activity is made possible by Scenario-based eLearning: Objectives and activities are induced from real world situations, framed as a scenario, where the teacher as well as the technology become facilitators, the students become writers and readers and the classroom can be accessible anywhere anytime.

In current society, the use of information technology is now an essential part of communication and Web technology allows people to access, and through new ways of communication, to interact with information. The fundamental point here is that learning becomes integrated in an authentic communication activity, by publishing information on the Web.

The AULA system is accessible at <http://chico.inf-cr.uclm.es/ppsv/aula.html>.

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