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The State of HCI in Ibero-American Countries

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Abstract: Human-Computer Interaction (HCI) is a challenging discipline that is currently concerned with the design, implementation and evaluation of interactive systems for human use, as well as the study of major phenomena surrounding them. Indeed, interdisciplinary communities formed by scientists, university teachers and students, people coming from the industry and customers related to HCI are emerging in different parts of the world. In particular, this article overviews the HCI community in the Ibero-American context, which involves hundreds of millions of people working or studying in HCI, whose cultural background is primarily associated with the Spanish and Portuguese languages and cultures, regardless of ethnic and geographical differences. Our final goal is to improve the visibility of this particular HCI community, enhancing the self awareness of its members and their individual motivation and future exchanges.

Keywords: human-computer interaction
Categories: A.1, H.5.2

1 Introduction

Human-Computer Interaction (HCI) is a challenging interdisciplinary discipline currently concerned with the design, implementation and evaluation of interactive systems for human use, as well as with the study of major phenomena surrounding them. Due to the growing relevance of HCI as a key discipline related to software development, some studies have been carried out to survey the situation of HCI in different contexts [Apperley et al., 03] [Baranauskas, 03] [Pribeanu and Chisălictă, 06]. The context, in this article, is a description of the current conditions under which

the product (an interactive system) will be used in an average situation, including cultural issues such as those proposed in [Marcus and West, 00] and [Shen et al., 06]. However, no in depth study has been performed during the last few years to summarize the situation of HCI in the Ibero-American context [1]. This context involves hundreds of millions of people working and studying in HCI, whose cultural background is primarily associated with the Spanish and Portuguese languages and cultures, regardless of ethnic and geographical differences.

To deal with the above situation, this article summarizes the current situation of HCI in the academic circles and industry of four Ibero-American countries. This situation was analyzed previously, in July 2005, during the Chijote Workshop (see Section 3). Emphasis was placed on the analysis of the teaching of HCI-related content. In order to assess the current situation in terms of HCI in Ibero-America, a group made up of Spain, Mexico, Brazil and Colombia was selected to be a sample of the entire area to be covered. Due to their geographical situation, describing the HCI reality in these four countries seems to cover a significant spectrum of the whole picture, which, in turn, describes the current HCI situation on the Ibero-American stage. Moreover, while Spain represents the HCI presence in Europe, Colombia and Brazil are represent South America, and Mexico represents the most relevant Ibero-American country in North America. Moreover, different topics were selected to extend the analysis beyond the academic setting. These topics included:

- 1) The state of the art in the teaching of HCI-related topics in Ibero-American under and post graduate studies (Section 2).
- 2) The main academic activities related to research in Ibero-America at the present time (Section 3).
- 3) Ibero-American communities and associations, as well as examples of organizations, that are focused on promoting HCI in companies and industry in general (Section 4).
- 4) The presence of Ibero-American consolidated private companies whose main activities are related to HCI (Section 5).
- 5) Recent publications of HCI-related books in Spanish or Portuguese, especially those focussing on teaching topics associated with HCI (Section 6).
- 6) The occurrence of weblogs, which promote HCI in Ibero-American virtual communities that have been on the web for more than three years (Section 6).

As previously stated, this article is based on a previous study presented by [Baranauskas, 03], [Collazos, 05], [Collazos et al., 05], [Baeya Yates, 05] and [Granollers, 07], where the situation of HCI in different Spanish-speaking countries was outlined. Our final goal is to raise awareness about the current situation of the HCI community in the Hispano-American [2] environment as well as to promote new interchanges between members of this emerging community.

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[1] The Ibero-American context is formed of Spain and Portugal in Europe, and all the countries in America that were once their colonies. Some definitions of Ibero-America also included almost 35 million people living in the USA with Spanish-related cultural origins.

[2] The Hispano-American environment is formed by Spain and all the Spanish-Speaking countries in America.

2 Teaching HCI in Ibero-American Countries

This section assesses the state of the art in HCI in Ibero-American academic circles. Table 1 shows the number of HCI related courses that have begun in Spain in the last few years according to results compiled by means of a questionnaire answered by twenty-one Spanish university teachers during the academic year 2006-2007. In addition, a pie chart on Figure 1 shows the current distribution of HCI related subjects with respect to the type of studies that include it within their syllabus Spain. Tables 2 and 3 summarize a section of the responses obtained; assessing the situation of HCI related subjects in different universities and high level teaching centres throughout Spain. The following information is included in the tables: the name of the Centre where the HCI related subject is taught (Faculty, University School), the type of studies (Informatics, Psychology, etc) where the HCI related subject is included, the proper HCI related subject name, the total number of credits (*#CR*) devoted to the subject (1 credit refers to 10 hours) within the current syllabus, the number of credits dedicated to HCI within the subject (*#HCI CR*), the subject's curriculum type (Mandatory *–M–*, Non Mandatory *–NM–* or Doctorate *–D–*), and the academic year when the subject began (*SC*).

Academic year	HCI-related courses
1996/97	3
1997/98	1
1998/99	2
1999/00	2
2000/01	6
2001/02	4

Academic year	HCI-related courses
2002/03	5
2003/04	7
2004/05	11
2005/06	11
2006/07	8
2007/08	3

Table 1: HCI-related courses started in Spanish Universities during the last 10 years

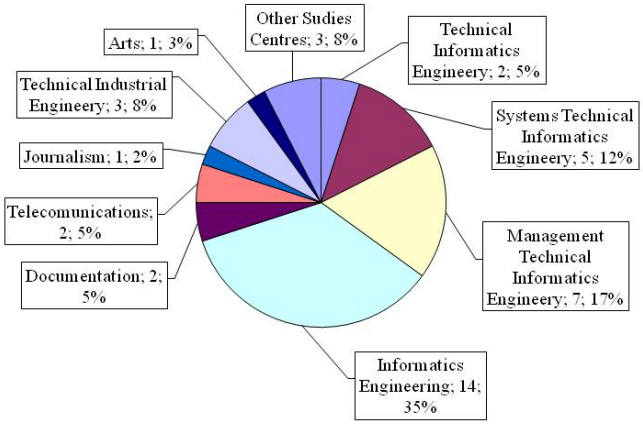

Figure 1: State of the Art in the Spanish HCI academia. Distribution of HCI-related courses in different under graduate and post graduate studies.

Centre/University	Studies	Subject Name	#CR	#HCI CR	Type	SC
ETS de Ing. Informática. Universidad de Sevilla.	- Ing. Informática - Ing. Técnica en Inf. de Sistemas - Ing. Técnica en Inf. de Gestión	Diseño de Interfaces Hombre-Máquina	6	6	NM	1997/98
	- Máster Oficial en Ingeniería y Tecnología del Software	Diseño Centrado en el Usuario	6	6	D	2007/08
EPS de Albacete. Univ. Castilla-La Mancha.	- Ing. Técnica en Inf. de Gestión	Multimedia, Hipermedia y Realidad Virtual	6	6	NM	2000/01
	- Ing. en Informática	Informática Gráfica	6	3	M	2000/01
		Interfaces de Usuario	4,5	4,5	NM	2000/01
	- Máster en Tecnologías Informáticas Avanzadas	Calidad en Interfaces de Usuario: Desarrollo Avanzado	6	6	D	2006/07
		Nuevos Paradigmas en HCI	6	6	D	2004/05
ETS de Ing. Informática. Universidad Rey Juan Carlos.	- Ing. Técnica en Inf. de Gestión	Interfaces Gráficos	6	6	NM	1999/00
	- Ing. Técnica en Inf. de Sistemas	Sist. Multimedia Distribuidos	6	6	NM	1999/00
	- Ing. Informática	Interfaces de Usuario	6	6	M	2004/05
	- Ing. Informática	Multimedia e Hipermedia	6	6	NM	2001/02
	- Master Oficial en Sistemas de Información en Ing. Informática	Seminario de SW Avanzado para la Sociedad de la Inform.	5	3	NM	2006/07
Universitat Oberta de Catalunya (UOC)	- Ing. Técnica en Inf. de Gestión - Ing. Técnica en Inf. de Sistemas	Interacció Humana- amb els Ordinadors	6	6	NM	?
	- Ing. Técnica en Inf. de Gestión - Ing. Técnica en Inf. de Sistemas	Final Degree Projects				?
	- Ing. Informática	Interfícies Multimèdia	6	6	NM	2004/05
	- Ing. Informática	Final Degree Projects				
	- Documentación	Interac. de Humanos con Ord.	4,5	4,5	NM	2003/04
EPS de Elche. Univ. Miguel Hernández	- Ing. de Telecomunicaciones	Diseño de Sistemas de Información Web	6	6	NM	2004/05
Fac. de Ciencias Sociales y Jurídicas de Elche. Univ. Miguel Hernández	- Licenciatura en Periodismo	Comunicación e Internet	4,5	2,5	M	2006/07
Fac. Informática de Barcelona. Univ. Politèc. de Barcelona (UPC)	- MSc in Computing	Realidad Virtual y Aumentada, Usabilidad y Presencia	3	1,5	NM	2006/07
Escola Universitària Politècnica Mataró (UPC)	- Eng. Tècnica en Informàtica	Interacció Persona Ordinador	7,5	7,5	NM	2002/03
EPS d'Enginyeria de Vilanova i la Geltrú (UPC)	- Ing. Técnica Industrial	Sistemas de Teleoperación	6	2	NM	2006/07
	- Ing. en Automática y Electrónica Industrial (segundo ciclo)	Sistemas de Producción Integrados	6	2	M	2004/05
	- Control, Visión y Robótica (Doct.) - Automática y Robótica (R. Master)	Teleoperación e interfaces hombre-máquina	4,5	2	D	2004/05
Fundació Politècnica de Catalunya (UPC)	- Master Eng. Informática	Diseño de Interfaces	3	3	M	2002/03
UPC / 9 Zeros (UPC)	- Máster de Creación para Medios Digitales	Usabilidad	1.6	1.6	M	???
ETSde Ing.s. Universitat de Valencia	- Ing. Informática	Entornos de Usuario	6	6	NM	2000/01
ETSde Ing. Informática. Universidad de Alcalá	- Ing. Superior en Informática	Interacción Persona-Ordenador	6	6	NM	2004/05
	- Información, Documentación y Conocimiento	Interacción Persona-Ordenador en Sistemas de Información Avanzados	6	6	D	2005/06
Fac. de Biblioteconomía y Documentación. Univ. de Barcelona	- Máster en Gestión de Contenidos Digitales	Interacción y Visualización	5	5	NM	2005/06
Fac. de Informática. Universidad del País Vasco	- Ing. Informática	Sistemas de Interacción Avanzados	6	6	NM	2001/02
	- Ingeniería Superior Informática	Interacción persona ordenador	6	6	NM	1998/99
	- Programa Doctorado	Interacción persona ordenador	3	3	D	2002/03
Centro Politécnico Superior. Univ. Zaragoza	- Ing. Informática	Interacción Hombre-Máquina	6	6	NM	1996/97
	- Posgrado en Servicios Web	IPO	5	5	-	-
	- Doctorado en Ing. Informática	Diseño y evaluación de interfaces	3	3	D	-
EPS. Universidad de Lleida	- Ing. Técnica en Inf. de Gestión	Introducción a la IPO	6	6	M	2001/02
		IPO (especialización)	9	9	NM	2001/02
	- Programa Doctorado en Ing.	Despliegue de la Accesibilidad y de la Usabilidad en Sist.Interact.	3	3	D	2005/06
		Diseño de Interfaces Físicas	3	3	D	2005/06
		Internacionalización y Modelos Culturales en las Comunidades Digitales	3	3	D	2005/06
		Ing. de la Usabilidad	3	3	D	2003/04
		Aprendizaje Colaborativo Asistido por Ordenador	3	3	D	2005/06
	- Master en IPO	Todas las asignaturas	60/120	60/120	-	2007/08
Facultad de Informática. Univ. Politécnica Madrid	- Ing. en Informática	Usabilidad y Diseño de Interfaces de Usuario	4,5	4,5	NM	2005/06
E.T.S.I. Telecomunicación. Universidad de Málaga	- Master oficial de postgrado en Tecnología de Telecomunicación	Ing. de la Interacción Hombre-Máquina	5	5	NM	2003/04
	- Ingeniero de Telecomunicación	BioIng.	4,5	0,5	NM	2005/06
Facultad de Bellas Artes. Universidad de Málaga	- Licenciado en Bellas Artes	Tecnología de Realidad Virtual para el Arte Interactivo	6	6	NM	2007/08

Table 2: State of the Art in the Spanish HCI academia. Based on [Granollers, 2007] (1st Part)

Centre/University	Studies	Subject Name	#CR	#HCI CR	Type	SC
E.T.S. de Ingeneria Informatica y de Telecomunicaciones. Universidad de Granada	- Ing. Técnica en Inf. de Gestión	Diseño de Inter. de Usuario	6	6	NM	
		Ing. del Software I	7,5	0,5	M	2000/01
		Ing. del Software II	7,5	0,5	M	2000/01
	- Master en Desarrollo de Software	Ing. de la Usabilidad	3	3	NM	2006/07
		Diseño de Sistemas Colaborativos	3	3	NM	2004/05
		Computación Ubicua	3	3	NM	2006/07
EPS. Universidad Autónoma de Madrid	- Programa Oficial de Postgrado - Master en Ing. Infor. y Telecos.	Interacción Persona-Ordenador	6	6	NM	1994/95
Dpto. de Sist. Informáticos y Computación. Univ. Politécnica de Valencia	- Máster en Dirección y Gestión de Sistemas de Información (Informática)	Presentación e Interfaces de Usuario	1,6	1,6	M	2003/04
	- Ingeniería en Informática	Interfaz Gráfica de Usuario	6	6	M	2004/05
Escola Elisava	- Graduado Superior en Diseño	Arquitectura de información	5	5	NM	2003
IDEC Universitat Pompeu Fabra	- Diploma de Postgrau en Tecnologies Digitals per la Comunicació Empresarial	Usabilidad y arquitectura de información	1.6	1.6	M	2003
ESC. Univ. de Ing. Técnica en Informática. Univ. de Oviedo	- Ing. Técnica Informática Gestión - Ing. Técnica Informática Sistemas	Comunicación Persona Máquina	4.5	4.5	M	2002
La Salle-Universitat Ramon Llull	- Ingeniería Técnica Multimedia	Usabilidad en Sistemas Interactivos			M	
	- Ingeniería Superior Multimedia	Ingeniería de la Usabilidad			NM	
	- Máster en Creación, Diseño e Ingeniería: Nuevos Servicios y Productos Interactivos	Usabilidad				
ES de Informática Universidad de Castilla - La Mancha (Ciudad Real)	- Perfil de Interacción Persona Ordenador	Sistemas de Interacción Persona-Computador	9	9	NM	
		Procesamiento de Datos Multimedia	4,5	4,5	NM	
		Sistemas de Aprendizaje	4,5	4,5	NM	
		Interfaces de Usuario	4,5	4,5	NM	
		Multimedia, Hipermedia y Realidad Virtual	4,5	4,5	NM	
		Sistemas para la Colaboración	4,5	4,5	NM	
		Tecnología del Habla	4,5	4,5	NM	
	- Doctorado	Sistemas Avanzados de Interacción Persona-Computador Sistemas Colaborativos y Computación Ubicua	4	4	D	
Universidad Carlos III de Madrid	- Ingeniería técnica en Informática de Gestión	Sistemas hipermedia: Diseño y Evaluación	5	5	NM	1996/97
	- Ingeniería en Informática	Diseño y Evaluación de sistemas Hipermedia	6	6	NM	2004/05
		Multimedia	4,5	4,5	NM	2002/03
		Interfaces de usuario	6	6	M	2002/03
	- Doctorado en Ingeniería Informática	Sistemas Hipermedia	3	3	D	1996/97
	- Máster en Ciencia y Tecnología Informática	Métodos de ingeniería para el desarrollo de sistemas multimedia y web	4,5	3	D	2005/06
		Interacción persona-ordenador en sistemas multimedia	4,5	4,5	D	2005/06
		Panorámica actual de los sistemas distribuidos, multimedia y seguros	1	0,3	D	2005/06
	- Máster en Ingeniería de la Web	Ingeniería de la usabilidad	3	3	M	2006/07
		Métodos de desarrollo	3	1,5	M	2006/07
Universidad de Vigo	- Ingeniería Informática	Diseño de Interfaces de Usuario	6	6	NM	
	- Programa de doctorado	Ingeniería de software basada en componentes reutilizables, aplicaciones en Interfaces Hombre-Máquina			D	2003/04
Universidad de Salamanca/Facultad de Ciencias	- Ingeniería Técnica en Informática de Sistemas	Interfaces Gráficas	6	6	NM	1998/99
Universidad de Salamanca/Escuela Politécnica Superior de Zamora	- Ingeniería Técnica en Informática de Gestión	Hipermedia: Diseño y Evaluación	7,5	7,5	M	2004/05

Table 3: State of the Art in the Spanish HCI academia. Based on [Granollers, 2007] (2nd Part)

An assessment of the questionnaire reveals that all the subjects that offer HCI in Spain total 294.2 credits, with 87.28% being purely HCI (258.5 credits) and grouped into 17 Mandatory (M), 43 Non Mandatory (NM) and 18 Doctorate subjects. With respect to the post-graduate HCI related studies in Spain, it is important to highlight that, in the academic year of 2007-2008, the first Master's degree entirely devoted to HCI taught in Spanish was launched (120 ECT credits). Moreover, this Master's degree in HCI is taught at the *Universitat de Lleida* (UdL) with the multidisciplinary participation of teachers from eight different universities (apart from the UdL) and six teachers from within the industry.[3] It must be remarked that the curriculum of this new Master's degree adheres to the recommendations of the AIPO society (see Figure 2), an emerging HCI society focused on the Hispano-American stage [Gonzalez et al., 07].

[3] See http://www.udl.cat/opencms/estudis/masters_eng/HCI.html (available in Spanish).

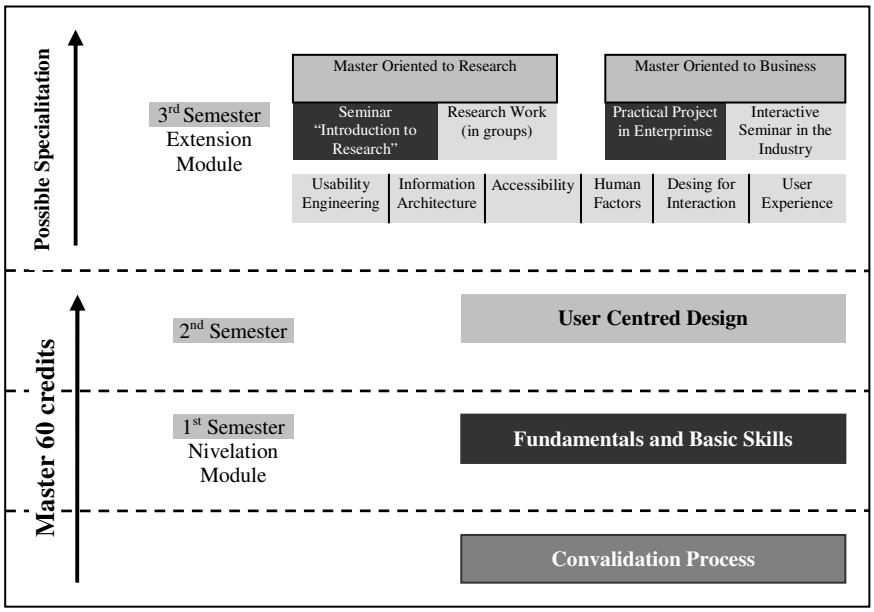

Figure 2: The Structure of the HCI Master's Degree Curriculum as Defined by the AIPO Society.

Regarding the situation in South America, [Collazos, 05] and [Baeza Yates, 05] suggested that one of the main problems associated with HCI teaching in South-American countries is the lack of an appropriate number of well trained teachers within said field, as well as the lack of well-equipped usability labs and lecture facilities. Furthermore, there are only a few courses that relate to HCI in both Colombia and Mexico, where these courses are mainly on offer within CS under and post graduate courses. In Mexico there are some institutions that offer HCI-related courses. Some examples are the *Centro de Investigación Científica y de Educación Superior de Ensenada* (CICESE), the *Universidad De Las Américas* (UDLA), the *Universidad Tecnológica de la Mixteca* (UTM), the *Instituto Tecnológico de Monterrey* (ITESM), the *Universidad Nacional Autónoma de México*, the *Universidad de Aguascalientes, the Universidad de Colima* and the *Universidad Michoacana de San Nicolás de Hidalgo*. One of the main reasons for incorporating HCI within the Mexican CS curriculum is that the HCI subject is evaluated in the CENEVAL[4] test. This test is applied on a regular basis to different universities in Mexico, implying that students and teachers need to be updated in HCI subjects.

The situation of HCI related courses in Colombia does not vary from that of Mexico. According to [Collazos, 05], HCI related training in Colombia began in 2004 with a non-mandatory subject in the Systems Department of the University of Cauca. Taking this as starting point, other universities are currently offering HCI related

[4] Centro Nacional de Evaluación para la Educación Superior, (http://www.ceneval.org.mx) is an institution that offers evaluation services to different institutions in Mexico.

courses. Colombian HCI teachers are participating in international events and the HCI discipline is acquiring relevance in Systems Engineering training programs. Nowadays, different HCI research groups with training vocations are emerging in Colombian universities [Collazos, 05] [Collazos et al., 05]. Currently there are universities such as the *ICESI* (Cali), the *Universidad de los Andes* (Bogotá), *Universidad del Quindío* (Armenia) and the *Pontificia Universidad Bolivariana* (Medellín) offering some HCI courses.

The case of HCI related courses in Brazil, as has been mentioned in [Baeza Yates, 2005], is the most advanced and representative of all the South American countries, the author explains this with regard to a classification of countries based on an HCI interest index. Moreoever, since 1996, HCI subjects have started being discussed in Brazil. In 1998 the first HCI workshop was organized in Brazil, conveying the creation of the local division of ACM SIGCHI [Baeza Yates, 05]. As a result, the Computing Society of Brazil has recommended the inclusion of HCI within the academic syllabuses of Computer Science. The most relevant university and post-graduate institutions where some courses of HCI are taught are *PUC-Rio* (Rio de Janeiro), *Unicamp* (São Paulo), *UFSC* (Santa Catarina), *UFRGS* (Rio Grande do Sul), *PUCRS* (Rio Grande do Sul), *UFRJ* (Rio de Janeiro), *UFF* (Rio de Janeiro), *UFMG* (Minas Gerais), *UFPe* (Pernambuco), *UFRN* (Rio Grande do Norte), *UniFor* (Ceará), *UFPR* (Paraná), and *UEM* (Paraná).

3 HCI Related Research in Ibero-American Countries

This section assesses the state of the art in HCI within the Ibero-American context in terms of scientific production and research. Note that even the participation of Ibero-American researchers and scientists can be observed in the majority of significant HCI related events in the World. Here, we will focus on describing some of the different research conferences and workshops taking place both within and outside the scope of the Ibero-American community. Therefore, the organization of HCI related activities in this particular environment will be remarked upon. Some examples are listed below:

- One of the most popular international congresses sponsored by the Spanish research community is called *Congreso Interaccion Persona-Ordenador* (Interaccion). This is an annual event that has been performed in Spain in recent years with the participation of the majority of Spanish universities. Moreover, the event includes the active participation of people from abroad, not only from other Ibero-American countries but also from other researchers from outside this particular community. The Interaccion Congress covers a variety of HCI and User Centre Design related subjects, promotes the participation of people in the industry, the interchange of research results and challenges, and self awareness amongst academic members of Ibero-American research groups.

- The Spanish *CHIJOTE* Workshop [5] is an important meeting sponsored by the AIPO society. According to the European Higher Education Area [6] (also

[5] See http://chico2.inf-cr.uclm/chijote2005/index.htm

known as Bologna Process) it is necessary to assure that HCI related curriculum content is taught in universities. This implies not only the promotion of HCI related courses but also the improvement of teaching methods in this field. Having this as a main objective, the AIPO society organized the 1st CHIJOTE Workshop in July 2005; an event that focused on the teaching of HCI in a Hispano-American and Spanish-Speaking context. The main goal of the workshop was to promote a multidisciplinary scenario in which to discuss and underline the future curriculum of the discipline (the fundamental HCI teaching guidelines for graduate, post-graduate and doctorate courses). Moreover, the result of the consensus achieved was the starting point for defining the HCI curriculum shown in Figure 2.

- The international congress *Encuentro Nacional de Computacion* (ENC) sponsored by the Mexican *Sociedad Mexicana de Ciencias de la Computación* (SMCC) is an important event for the promotion of HCI in Mexico. This Congress takes place in Mexico and gives HCI researchers from the Caribbean and other countries the opportunity to exchange knowledge and experiences. For example, in 2007 the ENC included an event called User Centred Software Information Systems, which was devoted to HCI and User Centred Design.

- Since 2006 Mexico has organized a special bi-annual workshop called Mexican Workshop on Human-Computer Interaction (MexIHC), with the aim of providing a forum for North America, Mexico and the Caribbean to promote an HCI interchange based in these areas.

- In 2007 Brazil sponsored and organized the well known Interact International Conference for the first time. As posted on their website, through its various submission categories, INTERACT 2007 provides a prime opportunity for diverse state-of-the-art approaches to general HCI issues both from academia and professionals, as well as newcomers to the HCI field.

- A relevant Latin American Conference on HCI (CLIHC 2003) was performed in Brazil (2003) and Mexico (2005). Moreover, the CLIHC Conference was a joint effort between the Brazilian BR-CHI, the Mexican CHI-Mexico and the Chilean CHI-Chile (ACM SIGCHI Local SIGs). The main goal of this bi-annual international conference is to foster communication and collaboration among HCI researchers and professionals from countries in Latin America and to consolidate the presence of the Latin-American HCI community abroad. In 2007 the CLIHC Conference was performed in Brazil again, jointly with the Interact International Conference.

4 Ibero-American HCI Societies and Associations

Different societies and associations prove the active participation of Ibero-American people devoted to HCI in and outside the academia and research environment.

[6] See http://ec.europa.eu/education/policies/educ/bologna/bologna_en.html

Throughout Latin-American, these associations tend to collaborate on a wide spectrum of activities. Some relevant HCI related societies and associations from Spain, Colombia, Mexico and Brazil are the following:

- The *Association Interaccion Persona Ordenador* AIPO (see www.aipo.es) is a consolidated interdisciplinary society related to HCI [Gonzalez et al., 07]. Its members belong to academia and the industry of different Spanish-Speaking countries, mainly Spain. This society was founded in 1999. Its main objective is to promote HCI related activities and knowledge in all its areas, as well as to establish agreements with other national and international societies [Lorés, 05].

- The *AIPO Colombia* (see http://groups.google.com/group/aipocolombia?hl=es) is the Colombian division of AIPO. This association started at the beginning of 2007 so as to enhance the main activities and goals of AIPO in the northern parts of South America.

- The CHISPA association (see www.chispain.org) is the Spanish division of ACM SIGCHI (The Association for Computer Machinery Special Interest Group on Human-Computer Interaction). Its main goals are to promote the scientific advancement of the field of human-computer interaction (HCI) in Spain, to sponsor conferences, workshops, courses, and other HCI activities in the country, and to serve as a bridge between HCI related groups and organizations in Spain and similar entities worldwide.

- The Brazilian Northeast CHI Association for Computing Machinery Special Interest Group in Computer-Human Interaction (BR-NE ACM SIGCHI) is a relevant Brazilian association devoted to HCI (see http://ead.unifor.br/brchi/). Moreover, it is actually the Brazilian division of the ACM SIGCHI, where people from both academia and the industry interact. Its main goal is to collect and disseminate information related to HCI through its official website. Other goals are sponsoring meetings, discussion groups, and workshops, and working with other ACM units on activities such as lectures, professional development seminars and technical briefings.

- The *CHI-Mexico* (see www.acm.org/chapters/chimex/) is the Mexican division of the ACM SIGCHI. As with CHISPA and BR-NE, CHI-Mexico's main goal is to raise awareness and promote greater interest in science, technology, design, development, and the application of HCI methods, tools, and techniques in Mexico.

Other important Ibero-American communities and initiatives related to HCI outside academia are, for example:

- The *Asociación Española de Profesionales de la Usabilidad* upa Spain (see www.upaspain.org). This association is the Spanish division of the American Usability Professional Association (UPA). This is focused on HCI practitioners outside Spanish academia.

- The *Comunidad de Arquitectura De Información y Usabilidad CADIUS* (see www.cadius.org) is a community focused on usability, information architecture and interaction design. This community is structured around an online discussion-list and periodic meetings in the most important cities of Ibero-America. It was founded in 2001, and currently has over 1,500 members worldwide.

- The *Alzado* organization (see www.alzado.org) is an independent online community in charge of publishing HCI-related articles. This organization has been in existence since 2002 with the objective of sharing real cases about information design, web development, multimedia, usability and data representation. Moreover, Alzado seeks to publish theory that will aid in the development of future projects focused on HCI and User Centre Design.

- *No Solo Usabilidad* (see www.nosolousabilidad.com) is a community similar to Alzado. Since 2003, its objective has been to publish an electronic multidisciplinary journal to promote the diffusion and interchange of knowledge between HCI practitioners, web developers and HCI-researchers.

5 HCI in Ibero-American Industry: Brief Overview

In recent years, diverse symptoms have expounded that the Ibero-American market is growing very fast to incorporate professionals with HCI backgrounds and solid knowledge about User Centre Design methods. Indeed, these kinds of professionals are currently required when developing or localizing interactive systems in this particular scenario. Note that important Ibero-American companies have created internal groups dedicated to HCI in order to ensure the quality of their products. For example, the Use Engineering Group [7]. This multidisciplinary team is formed of specialists in cognitive psychology, ergonomics, and User Centred Design specialists. It belongs to the Methodology and Engineering Software Division of Telefónica, one of the most important communication companies in Ibero-America.

In addition, an emergent HCI and usability consultancy market has caused the consolidation of specialized companies in Ibero-America. As a result, the current HCI restlessness of companies has generated the necessity of training in usability and User Centred Design for professionals, for both their companies and suppliers, which translates to a demand for internal training [Perdrix et al., 2005]. Some of these companies located in Spain, Colombia, Mexico and Brazil are, for example:

- *Claro Studio* (see www.multiplica.com/experiencia.asp?idioma=ESP) is a company that conducts usability-tests and other user research for global companies that wish to test their products in Spain and South America. All research is conducted by facilitators skilled in psychology and advanced usability techniques. Since the end of 2005 Claro Studio has joined its activity with Multiplica Company, offering HCI services integrated with greater interactive solutions.

[7] Telefónica I+D Usability website: http://www.tid.es/html/boletin/usabilidad.html

- *Xperience Consulting* (see www.xperienceconsulting.com) established in Spain. Since 2001 this company has offered consultancy, online measurement (e-Metrics), investigation and training around the user experience field.

- *The Cocktail* (see http://www.the-cocktail.com), a consultant of user experience and interaction design devoted to the development of digital products or services.

- *Usolab* (see www.usolab.com) is a consultancy specialized in usability and UCD initiated at the end of 2001. Usolab has been centred mainly in analyzing the usability, making recommendations and redesigning the websites of financial organizations. They also offer usability training (internal courses for companies and open seminaries).

6 Publications and Blogs. Promoting HCI Related Topics in Ibero-America

Apart from the proceedings of events mentioned in Section 3, there is an emerging necessity for HCI-related material in Ibero-American languages (Spanish, Portuguese and Brazilian mostly). Moreover, teaching activities related to HCI in the Ibero-American stage require some written material in mother tongues of their students so as to improve their first contact with HCI related topics. For example, the books listed below could be mentioned:

- *La Interacción Persona-Ordenador* [Lores et al., 01]. This is an electronic book sponsored by the AIPO association which covers a wide spectrum of HCI related topics, such as Ergonomics, Usability Methodologies, Accessibility, Web Design, CSCW, etc. The book is currently available on CD and a free download from the AIPO website (see http://griho.udl.es/ipo/libroe.html)

- *Interfaces de recuperación de información: conceptos, metáforas y visualización* [Marcos, 04]. In this book, the author describes the concepts of HCI discipline from the viewpoint of the Documentation and Information Retrieval areas.

- *Personas y Maquinas: el diseño de su interacción desde la ergonomía cognitiva* [Cañas, 04]. In this work the author explains how to design the interaction process from a cognitive viewpoint.

- *Diseño de sistemas interactivos centrados en los usuarios* [Granollers et al., 05]. The authors describe a particular UCD process that is used for teaching HCI related topics in courses they teach. Moreover, the authors explained the development of a website devoted to HCI and User Centred Design (see www.mpiua.net). This website is permanently up dated with examples and research advances so as to act as learning support material for HCI teachers and students.

Finally, we want to comment on the exponential emergence of weblogs dedicated to HCI related fields within the Ibero-American context. Indeed, this is another parameter that shows the emergence of HCI issues in this particular environment. Some of these include: Cadius weblog (see ww.cadius.org/weblog), the Usalo weblog (see http://usalo.es), the E. Gutierrez y Restrepo personal accessibility weblog (see http://bitacoras.sidar.org/emmanuelle), the E. Manchón personal weblog (see http://eduardomanchon.com), the biguel weblog (see http://biguel.com), the Accessibility weblog (see http://accesibilidad.blogspot.com), the G4 Usability Sidar group (see www.bitacoras.sidar.org/g4) website, the J. L. Velázquez personal weblog (see www.jlvelazquez.net) and the H. Matas personal weblog (see www.dnxgroup.com/humberto/index.php) defined as part of Dnx website.

7 Conclusions and Future Work

The Ibero-American context involves hundreds of millions of people whose cultural background is primarily associated with the Spanish and Portuguese languages and cultures, regardless of ethnic and geographical differences. Indeed, Ibero-America covers a wide geographic area including Spain and Portugal in Europe and all the Spanish and Portuguese speaking countries from northern Mexico to southern Chile and Argentina. Although the situation related to HCI has been summarized for other scenarios [Apperley et al., 03] [Pribeanu and Chisălictă, 06], no in depth study has been performed to describe the current situation associated with HCI in Ibero-America.

To cope with the above problem, this article assesses the current state of the art in HCI in the Ibero-American context. Primarily, four countries were chosen as a representative sample to cover this particular scenario. These countries were Spain (representing the European part of the Ibero-American HCI community), Colombia (the country in South America with the biggest Spanish-Speaking population), Brazil (standing for the Portuguese-speaking population of Ibero-America) and Mexico (serving as an example of the presence of the Ibero-American population in North America). Next, six different topics were selected to extend the analysis beyond the academic environment. These topics were 1) the state of the art in the teaching of HCI-related topics in under and post graduate studies in Ibero-America (Section 2), 2) the principal academic activities related to research in Ibero-America at the present time (Section 3), 3) Ibero-American communities and associations, including examples of organizations focused on promoting HCI in industry and companies (Section 4), 4) the existence of Ibero-American consolidated private companies whose main activities are related to HCI (Section 5), 5) the recent publications of HCI-related books in Spanish or Portuguese, especially those devoted to teaching topics associated with HCI (Section 6), and 6) the occurrence of weblogs to promote HCI in Ibero-American virtual communities that have been on the web for over three years (Section 6).

To carry out our survey we included the analysis of a questionnaire that was answered by Spanish university teachers of HCI (representing both under and post graduate studies in Spain). Moreover, based on [Baranauskas, 03], [Collazos, 05], [Collazos et al., 05], and [Baeza Yates, 05] the situation concerning the teaching of HCI related topics in Colombia, Mexico and Brazil were briefly described. We can

conclude that the presence of HCI related courses in Ibero-America is still scarce. However, a considerable number of HCI related courses and the first Master's degree completely devoted to HCI in Spanish can be observed when regarding the situation in Spain during the last five years. Taking into account that many of these courses are part-time and that many Latin-American students move from America to Spain and Portugal to take postgraduate courses, the consolidation and expansion of HCI related teaching can be predicted for the next few years. Furthermore, a significant demand for well trained university HCI professionals can be detected currently in many Ibero-American companies working in the field of software development [Perdrix et al., 05].

Concerning the second topic under consideration, we focus on the analysis of academic events organized and carried out in the four countries considered during the last few years. A number of nationally and internationally relevant congresses and workshops were detected (see Section 3). It must be remarked that although many of the papers observed were written in Spanish and Portuguese, the presence of publications in English is growing. This might suggest the necessity of the Latin American researchers and scientists of being understood by non-Spanish or Portuguese speakers. Moreover, the presence of Latin American researchers is increasing in international events associated with HCI. Note that for social and economical reasons, many Latin American researchers and teachers have to make a considerable effort to obtain economic support for attending international conferences abroad.

With regard to the third topic, we can conclude that HCI is a relevant issue in Latin America. In the four countries analyzed there were national and international associations and communities related to this discipline. In many cases, these associations are officially linked with the ACM SIGCHI Interest Group [8] of the Association for Computer Machinery (ACM). Note that beyond academia, a considerable number of Latin-American independent communities and associations devoted to HCI can be observed. These associations are mainly made up of young HCI related professionals and students who communicate with each other via the Internet.

Although the purpose of this article is not to make commercial propaganda, some important companies were included as an example that proves the emergence of HCI in Latin-American industry associated with software development (See Section 5). Furthermore, the existence of groups specialized in HCI are becoming common inside big Latin American companies (e.g. Telefonica). In the same way, HCI related books have been published in the last few years that cover a wide spectrum of HCI related topics in Spanish and Portuguese. However, the presence of HCI related literature in English is still predominant even in the Ibero-American environment. Finally, the occurrence of weblogs that promote HCI in Latin-American virtual communities that have been on the web for more than three years was analyzed (Section 6). Surprisingly, there is a great number of such weblogs on Internet with very active user participation (see Section 6).

On the basis of our research and analysis we can conclude that HCI is currently an emerging and promising discipline in Ibero-America. Although a lot of work needs

[8] See http://sigchi.org/

to be done, HCI has been shown to be a new yet secure area of interest within this particular scenario. Part of our future work is focused on analysing the selected topics in other Ibero-American countries like Chile and Argentina. Moreover, a more in depth study concerning the presence of Ibero-American authors in major HCI related journals should be included. The questionnaire carried out in Spain must be propagated in order to improve understanding on the current situation of Ibero-American HCI related courses outside this country. In the same way, alternative questionnaires must be performed to cover Ibero-American HCI related professionals and people devoted to HCI outside academia. Work on all these areas is currently being pursued.

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