

# The digital competences in the curriculum of postgraduate studies of the professionals of health. The role of the librarian as a trainer in formative programmes.

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## ABSTRACT

The libraries specialized in health sciences, located in hospitals and health centers, are defined within the fields of biomedicine, nursing and physiotherapy. They are called hospital libraries and its mission is directed to users who need information for clinical practice, teaching and research.

Recently, the concept of information literacy has been added to the professional practices of the librarians working at hospital libraries, although traditionally health librarians have devoted most of their professional work to teaching users in different techniques of search, retrieval and information management. The demands made by professionals have expanded these functions at the beginning of the 21st century, adding media skills and literacy in the new digital ecosystem. New literacies go beyond the understanding and management of technology and encompass learning, critical thinking, and information literacy skills. This information literacy empowers individuals and communities.

The objective is to evaluate the training program based on the achievements and levels of acceptance and satisfaction of the professionals who participated.

The training activity has been designed for professionals in the Health Management Area "Este de Málaga-Axarquía" (AGSEMA), both in the Hospital com in Health centers. This training activity has been accredited by the Health Quality Agency of Andalusia. Using the training platform of the AGSEMA, the quality evaluation platform of the Andalusian Health Quality Agency (eValua), the teaching materials were housed on a "Moodle" platform and communicative and management tools from the web 2.0 were used.

At the time of writing this informs, a total of 116 professionals have received the training and 176 professionals have requested it.

Information professionals have shown a special interest in knowing and acquiring the competencies that society demands from health professionals in the 21st century: capacities to seek pertinent, relevant and truthful information, generate knowledge and disseminate information to multiple audiences in the Society-Network.

## CCS Concepts

• Social and professional topics~Information technology education • Social and professional topics~Computing education programs

- Social and professional topics~Informal education
- Social and professional topics~Adult education
- Social and professional topics~Seniors.

## Keywords

Lifelong Learning, Higher education, Development Projects, Competence Literacy, Library Health, Medical Library, Digital Competences, Media literacy, Information Literacy, professional Health.

## 1. INTRODUCTION

Currently, the Internet has become the center of the Information Society radically changing social relations, communications, interaction, education, training and leisure. It is a new communicative paradigm that emerges as a media convergence characterized by the hyper-connectivity and ubiquity of technology overcoming the space-time barriers and creating a new society different from the 20th century model.

Today's world is experiencing a spectacular Internet development. Technologies (mobile technologies, Web 2.0), hyper-connectivity (Social learning, learning 2.0) and new tools (social software) generated by the Information or Knowledge Society are coming together tending to convergence in this world [5].

This context of constant and polyhedral change -comparable to the great revolutions of mankind: Writing and Printing- leads to new learning needs that demand a new literacy. Kellner [23], Kress [24] Dusell [34], Croket [10].

According to Pérez Escoda [30], the change in learning is defined by three parameters that have acquired greater presence in the design of new literacies:

- a) A new communication system which, in addition to a social space of interaction characterized by a global network that maintains mankind constantly connected, demands different communicative, media and digital competences.
- b) A continuous flow of information whose accessibility in the network and growth make indispensable competences and abilities never previously presented before for the management of information, for devising and designing organizational structures of the network such as Personal Learning Environments or

Networks (PLE, PLN) (Castaneda) or making a critical and responsible use of information [3] [26] [4]

c) A proliferation of connected screens, accessible anytime and anywhere, with the possibility of creating contents and spaces of knowledge anywhere, from a repertoire of digital tools - unimaginable twenty years ago -, which requires digital competences from a new attitude of collaboration and global collective intelligence [29] [31].

## 2. THE DIGITAL COMPETENCIES TRAINING OF THE USERS OF THE LIBRARIES AT HOSPITALS AND HEALTH CENTERS

The specialized health libraries, located mostly in the hospitals of the National Health System in Spain, have traditionally been defined as Hospital Libraries and their mission is addressed to a typology of users with very specific needs for scientific information [17].

Until now, the concept of digital competences - Information Literacy (ALFIN) / Information Literacy (INFOLIT) and Media Literacy and Information Literacy (MIL) - is largely centered on the scope of university libraries, but it is of vital importance in the context of the hospital libraries, where training is provided to professionals already immersed in professional practice and postgraduates in their training period (Doctors, nurses, pharmacists, physiotherapists).

Health professionals are used to consult the most popular databases in the medical field such as MEDLINE, which is accessible free of charge since 2007 from PubMed. In PubMed the emerging technologies are regularly and punctually incorporated, to access to the management services or for searching and interaction in the reading universe. PubMed can be consulted from the mobile phone, has a social reading network like PubMed Commons, and offers the possibilities to share articles on social networks as Facebook, Twitter and Google Plus. PubMed Central incorporates reading applications for IOS and Android and gives you the option of downloading the documents in several standards for different digital readers or in its integrated PubReader™ reader. (Figure 1,2)



Figure 1. PubMed Central Tools for a digital and social reading

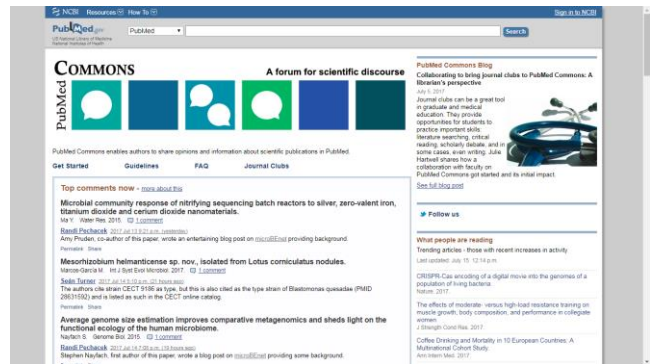


Figure 2. PubMed. Health Professionals Social Network

Since the user has not received training on this, these developments in PubMed are mostly unnoticed for the user –they are not included in the programming of continuous training activities-, however, practitioners and nurses make intensive use of various technologies in their professional practice and are motivated to use them.

The information literacy in the health and health-related fields incorporates the competences of the disciplines of medical knowledge, nursing, physiotherapy and related disciplines in the management of scientific information beyond the instrumental skills. Informational competencies are understood as the way to know, evaluate critically and manage the sources of evaluated and quality scientific and biomedical information. Its aim is to recognize, identify, obtain, organize, interpret and use the most adequate sources of information to recover the most relevant records and to assess their applicability in clinical practice and to communicate the results of a study or research.

Curricular designs in the 21st century should include a formative program to achieve the competence in the digital ecosystem in the access to information and to recognize its interdependence with the accomplishment of the Media Competence (Media literacy).

Owning the ALFIN and AMI competencies is crucial for the competitive advantages of health professionals, doctors and nurses in their residence period and students of graduate, master and doctoral degrees. This provides the means for effective access, use and creation of content, in support of the development of health services for the population [28] [20] [22].

### 2.1 Professional librarian role

Including in the curriculum of the training programs the acquisition and / or development of this competence - which university students should have started in their academic period - should involve the integration of the professional librarians in training activities for all health professionals

The specialized bibliography proposes a professional who knows disciplines as computers, computer science, health care policy, documentation, education, who possesses knowledge on investigation and communication technologies, who connects people and information, who can get involved in a working team. Some authors identify this figure with the embedded health librarian [7, 19, 32] [27].

Sheila Corral reviews the specialized literature on the proposal of professionals for the 21st century and the patterns of evolution and evaluation of the development of professional competence in a new information ecosystem. Her work illuminates the panorama

of trends of the professional future in the change that arises at the beginning of the century [9].

Bell and Shank identify proposals that establish the position of the librarian as a center of provision of information resources including the promotion of teaching resources and materials, the learning management systems and the virtual learning environments as the places where students and health professionals access to information resources and, finally, the establishment of institutional repositories as open files where professionals and / or students can access the set of learning objects [2]

From the systematic review we can conclude that the published works on digital reading focused on the study of the appropriation of reading devices and the impact of reading devices on the promotion of reading in the educational environment and the comparison between reading in digital and printed media and the roll of the librarian in this context [8, 11, 16, 25].

The training program arises from a previous field work in the Health Area of Axarquía, based on a prospective analysis of the Information Literacy competences of professionals in the Axarquía Area during the year 2016 [13-15].

The program is designed with the purpose of being a tool of empirical analysis on the need to include within the curriculum of health professionals the competencies Information Literacy and Media Literacy.

### 3. OBJETIVES

To evaluate the training program based on the achievements and levels of acceptance and satisfaction of the professionals who participated.

### 4. MATERIAL AND METHOD

A bibliographic review on the training programs in hospital libraries has been started to achieve the accomplishment of the competition. To manage the bibliography it has been used the reference manager Mendeley.

The training activities took place from April to June 2017. The design of the activity consisted of 5 training sessions corresponding to the five basic competences on ALFIN established in the Horizon 2020 of the European Union [33].

In the design of the training sessions there is a commitment for the use of web 2.0 as a learning tool and as an introduction to the training to acquire AMI competences in future programming.

The following bibliographic sessions were designed:

- 1.-Searching for information in health sciences.
- 2.-The management of the information: The bibliography Managers.
- 3.-Creation of knowledge: The publishing ecosystem and the scientific visibility.
- 4.- Communicating and Dissemination: Use and management of scientific information. The digital identity.
- 5.- Troubleshooting: Open Publishing at the Institutional Repositories.

The sessions were face to face and they were accredited by the Andalusian Health Quality Agency [1]. The institutional training platforms Gesforma [18] and eValua [12] were used.

Population: 116 participants in the on-site training actions, voluntarily enrolled.

Teaching materials used for training activities: Blog, Pinterest, Slideshare, Youtube, Twitter, Facebook and other communicative tools of web 2.0.

### 4.1 Evaluation of the training activity

Pre-test and post-test evaluation on the contents and development of the competition to be acquired. Satisfaction questionnaire for those attending the activity.

## 5. RESULTS AND DISCUSSION

At the time of writing this communication of the five designed sessions, there have been 13 editions of Activity1 (The search for information in the health sciences) which were attended by 86 participants. Activity 2 (Information management: bibliography managers) was attended by 25 people. The activity (Communicating and Disseminating: Use and management of scientific information) has been attended by 5 people. As of June 30, 2017, there are 174 pre-registered professionals to receive training in the editions that will be resumed soon.

### 5.1 Activity 1. Searching and Information Management

59% of those attending training activity 1 were practitioners and / or specialists, 27% were nurses, midwives and / or physiotherapists and 14% belonged to other professional categories; Social Workers, Health Technicians and / or administrative and service personnel. (Table 1).

**Table 1. Summary of the training activities.** SN: Number of session, PT: Number of Participants, PP: Percentage of physicians in the participants, PN: Percentage of nurses in the participants. PO: Percentage of other professionals. SO: Total number of solicitudes. NP: Still not published

Title	SN	PT	PP	PN	PO	SO
Search and management of information	13	86	59%	27%	14%	36
Management of the information	6	29	62.1%	37.9%	0	53
Communicating and disseminating the information	3	5	3	0	0	47
Publish in open access. How and Where	0	0	0	0	0	38
Digital identity of the professionals of health	0	0	0	0	0	NP

From the pre-test analysis, 94.4% of participants stated that they knew how to identify when they need to seek information. 30.3% stated that they know where to find it, 52.8% said that "they do not always know where to look" and 16.9% did not know where to look for it.

On the question, if you know the databases and / or sources of information in your area of knowledge in digital format, 13.5% state that they know them, 47.2% are not sure about them and 39.3% do not know them. 44.9% and 42.7% are not sure and do not know how to effectively locate the books and / or digital journals in their area of knowledge, only 12.4% state in the pre-test evaluation that they do know how to locate them Effectively.

To the question if they know the option of MyNCBI in PubMed that is the most consulted source of information by the health professionals, 86.5% answer that they do not know it, 10.1% affirm that they know it and 3.4% have heard about it.

Analyzing the post-test evaluation, 59.8% stated that they do know how to search for information in the specific database of their area of knowledge, 59.8% answered that they know how to search quickly and effectively and 33.3% answered that they don't feel safe in the way they try to find information. One of the tools implemented in PubMed, the source of information most used by health professionals, implements an utility MyNCBY to manage one's own searches and the bibliography. To the answers in the pre-test for users of it, 86.5% stated that they did not know it, in the post-test 58.9% reported knowing it. It should be noted that this tool was presented in the formative action to all that implies that in 59% of those attending training activity 1 were practitioners and / or specialists, 27% were nurses, midwives and / or physiotherapists and 14% belonged to other professional categories; Social Workers, Health Technicians and / or administrative and service personnel (Table 2).

**Table 2. Differences Pre-test/Post-test in the Activity: "Search for Information".** Item: Items from the questionnaire, Pre-Test Percentage of affirmative responses in Pre-test. Post-Test: Percentage of affirmative responses in Post-test.  $\Delta$ : Increase, in percentage of affirmative responses.

Item	Pre-test	Post-test	$\Delta$
Can you identify when you need information??	94.4%	96.6%	+ 1.2%
Do you know where you can search for the information you need?	30.3%	33.3%	+3.3%
Do you know the data bases available about your knowledge area in the virtual library?	13.5%	65.5%	+52.0%
Can you search for scientific information and find it fast and efficiently?	12.4%	59.8%	+47.4%
Do you know the option My NCBY in PubMed?	10.1%	59.8%	+ 49.7%

The results show that the activity has been effective in acquiring new information and it must be emphasized that the increase is due to the use and management of digital access tools and use tools, since the participants know and know how to use the information in traditional editions. Participants had not received formal training in digital information sources, use of relational databases, metadata management, logical operator management, knowledge of Internet knowledge bases, meta-search engines, etc.

## 5.2 Activity 2. Information management: bibliographic managers.

25 professionals participated. 62.1% were Physicians, Optional Area Specialist and / or Pharmacists, 37.9% were nurses. Only 17.2% had received specific training on bibliographic managers. This activity was the most valuable because it was a very important step to save the references, store the pdf, import references from the word processor and add notes to the bibliography, and manage one's own library.

## 5.3 Tools 2.0

The activity of the library, previously to the training activity, had a community of 3322 users (as of July 7, 2017). In order to provide training to the community of the area of the Axarquía three groups were created.

Facebook: ALFIN community with 18 users

Facebook Community Researchers Axarquía: 43 users

Facebook: Axarquía-e Community: 520 users

Pinterest Community: 199 followers

Blog: 2 views

Social Network / Web 2.0 N° Users / Followers

Library Axarquía: 3322 followers

Blog Training

Networks and tools such as SlideShare, Pinterest, Scribd, iVoox, and others were previously open channels as experimentation and testing sites that the Librarian of the Axarquía Area had previously opened and also used in training activity.

## 5.4 Satisfaction of the participants in the training action.

In the evaluation questionnaire of the training activity, we have included suggestions for the training activity to be continued individually and / or through resolution of specific cases in the workplace. It has also been observed that the activity has been positively valued for the relevance of appropriateness of the contents but it has been insufficient. (Table III).

**Table 3. Satisfaction of the participants in the training action.** Mean $\pm$ s.d.: Average score plus/minus standard deviation.

Questionnaire items	Mean $\pm$ s.d.	
	Activity 1	Activity 2
The aims and expectations regarding the session have been fulfilled	8.71 $\pm$ 1.03	9.2 $\pm$ 1.0
The contents approached in the session have been found useful.	8.94 $\pm$ 1,37	9.4 $\pm$ 1.00
The results and conclusions reached in the session can be applied directly to my professional practice.	9.02 $\pm$ 1.39	9.52 $\pm$ 0.87
The didactic methodology used by the teachers has been appropriate for the optimal development of the session.	8.4 $\pm$ 2.15	8.48 $\pm$ 1.29
In general terms, I feel satisfied with the participation of the people who have participated as teachers.	9.00 $\pm$ 1.11	9.72 $\pm$ 0.84
The teacher has transmitted and expressed properly the ideas and contents with the correct use of the verbal and non-verbal expression	9.15 $\pm$ 1.41	9.56 $\pm$ 1.26
The teacher has shown to have a command of the contents presented	9.25 $\pm$ 0.96	9.76 $\pm$ 0.66
The teacher has achieved the involvement of the participants in the development of the session.	9.05 $\pm$ 9.05	9.72 $\pm$ 0.89
In general terms, I feel satisfied with the development of the session	8.99 $\pm$ 1.41	9.360.86

## 6. Conclusions

The activity has been positively valued for the appropriateness and relevance of the contents, but it was insufficient to achieve effectively the proposed objectives.

We conclude that health professionals have credible competencies in the use of information and in problem solving. But they do not know the instrumental means of the new digital ecosystem of access, production, management and dissemination of information.

Health professionals in the knowledge society demand educational programs that include the ALFIN and AMI competencies to promote lifelong learning. Local, regional and state authorities should adopt strategies for the health professionals to acquire the informational skills.

The strategy should promote the professional development of health librarians as integrated personnel in training programs that are based on principles and practices on information competencies

The digital ecosystem has transformed work routines into health libraries which have led to a change of roles among the professionals working in it. The change must involve the librarian's commitment to continuous learning, collaboration and integration of the teaching staff in the tasks of Literacy, addressing problem solving and promoting confidence in the processes of change.

The boundaries between related sectors such as trainers and librarians are disappearing. Many organizations are regrouping and blending activities that formerly corresponded to separate units; library, edition and publishing under a single general management. This emerging context includes a new field of research in which people, information, communication and training in the workplace interrelate, which implies addressing and defining professional development and continuing education in this new literacy context.

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## 8. REFERENCES

- [1]. Agencia de Calidad Sanitaria de Andalucía: 2017. <http://www.acsa.junta-andalucia.es/agenciadecalidadsanitaria/>. Accessed: 2017-07-07.
- [2]. Bell, S.J. and Shank, J. 2004. The blended librarian: A blueprint for redefining the teaching and learning role of academic librarians. *College & Research Libraries News*. 65, 7 (2004), 372–375.
- [3]. Cantwell, K. 2010. Information Literacy Landscapes: Information Literacy in Education, Workplace and Everyday Contexts. *Australian Academic & Research Libraries*. 41, 3 (2010), 221–222.
- [4]. Castañeda, L. Entornos personales de aprendizaje: claves para el ecosistema educativo en red. <http://www.um.es/ple/libro/> Accessed: 2017-07-07.
- [5]. Castells, M. 2001. *La galaxia internet*. Plaza & Janés.
- [6]. [Chochrek, D. 2000. Market the value of your competitive intelligence: an added role for the information center. *Information Outlook*. 4, 2 (2000), 32–35.
- [7]. Cooper, I.D. and Crum, J.A. 2013. New activities and changing roles of health sciences librarians: a systematic review, 1990–2012. *Journal of the Medical Library Association : JMLA*. 101, 4 (Oct. 2013), 268–277.
- [8]. Cordón, J.A. 2017. La lectura en el entorno digital: nuevas materialidades y prácticas discursivas. *Revista Chilena de Literatura*. 0, 94 (2017).
- [9]. [1]Corrall, S. 2005. Developing models of professional competence to enhance employability in the network world. *Continuing Professional Development—Preparing For New Roles In Libraries: A Voyage of Discovery*. 116, (2005), 26–40. Creswell, J.W. 2013. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. SAGE Publications.
- [10]. Dantas, T. and Gómez, R. 2016. Cartografía de la investigación en lectura digital. *Las investigaciones de Territorio Ebook en el contexto internacional. M&E: Métodos de Información*. 7, 13 (2016), 191–211.
- [11]. eValúa <http://www.juntadeandalucia.es/agenciadecalidadsanitaria/for-macionsalud/microsite/cms/es/evalua/> /. Accessed: 2017-07-07.
- [12]. Fernández-Luque, A.M., Gómez Díaz R. and Cordón García, J.A. 2016. Digital Habits and Competences of Health Professionals the Health Area East of Málaga-Axarquía (MÁLaga). *Proceedings of the Fourth International Conference on Technological Ecosystems for Enhancing Multiculturality* (New York, NY, USA, 2016), 253–260.
- [13]. Fernández-Luque, AM; García-Navas, B<sub>J</sub>V and García-Navas 2016. Knowing the digital reading-writing habits of the Resident Medical Interns (RMI) in postgraduate training in the Health Area East of Malaga-Axarquía.
- [14]. Fernandez-Luque and Dantas, T 2016. Prácticas lectoras de los profesionales de la salud en un área Sanitaria de Málaga.
- [15]. Cordón García, J.A. 2016. La lectura digital y la formación del lector digital en España: la actividad de la Fundación Germán Sánchez Ruipérez y el Proyecto Territorio Ebook. *Álabe*. 0, 13 (Jun. 2016).
- [16]. García Martín, M Asunción 1999. Estándares para bibliotecas de Ciencias de la salud. (1999). <http://www.sedic.es/wp-content/uploads/2015/11/estandar.pdf> Accessed: 2017-07-07.
- [17]. Gestión Integral de la Formación: <http://ws-gesforma.axarquia.sas.junta-andalucia.es:8081/gesforma/>. Accessed: 2017-07-07.
- [18]. Greyson, D., Surette, S., Dennett, L. and Chatterley, T. 2013. “You’re just one of the group when you’re embedded”: report from a mixed-method investigation of the research-embedded health librarian experience. *Journal of the Medical Library Association : JMLA*. 101, 4 (Oct. 2013), 287–297.
- [19]. Grifol-Clar, E., García-Martín, M.-A. and Santurtún de la Hoz, M.J. 2015. Programa marco de Formación de Competencias Informacionales para Usuarios de Bibliotecas de Ciencias de la Salud en hospitales. <http://eprints.rclis.org/28708/> Accessed: 2017-07-07

- [20]. [1]Himanem, P. 2002. La etica del hacker y el espiritu de la era de la informacion/ The Hacker Ethic and Spirit of the Age of Information. Destino Ediciones..
- [21]. IFLA - Faros para la Sociedad de la Información: Declaración de Alejandría Sobre la Alfabetización Informacional y el Aprendizaje a lo Largo de la Vida: <https://www.ifla.org/node/7275>. Accessed: 2017-06-25.
- [22]. Kellner, D. 2004. Technological Transformation, Multiple Literacies, and the Re-Visioning of Education. *E-Learning and Digital Media*. 1, 1 (Mar. 2004), 9–37.
- [23]. Kress, G. 2005. El alfabetismo en la era de los nuevos medios de comunicación. Ediciones Aljibe, S.L.
- [24]. [1]Alonso-Arévalo, J. and Cordón-García, J.-A. 2013. Lectura digital y aprendizaje: las nuevas alfabetizaciones. (Dec. 2013). Lloyd, A. 2010. Information literacy landscapes: Information literacy in education, workplace and everyday contexts. Elsevier.
- [25]. McKnight, S. 2002. Managing cultural change: the challenge of merging library services, curriculum development and academic professional development. *IFLA journal*. 28, 5–6 (2002), 266–272.
- [26]. Millán Núñez-Cortés, J., Civeira-Murillo, F. and Gutiérrez-Fuentes, J.A. 2011. El hospital universitario del siglo XXI. *Educación Médica*. 14, 2 (Jun. 2011), 83–89.
- [27]. Pérez Escoda, A. 2015. Alfabetización Digital y Competencias Digitales en el Marco de la Evaluación Educativa: Estudio en Docentes y Alumnos de Educación Primaria en Castilla y León. (2015).
- [28]. Pérez-Escoda, A., Aguaded, I. and Rodríguez-Conde, M. o José 2016. Digital Generation vs. Analogic School. *Digital Skills in the Compulsory Education Curriculum*. *Digital Education Review*. 0, 30 (Dec. 2016), 165–183.
- [29]. Rotstein, B., Scassa, A.M., Sainz, C. and Simesen de Bielke, A.M. 2006. El trabajo colaborativo en entornos virtuales de aprendizaje. *Cognición*. 1, 7 (2006), 38–45.
- [30]. Tan, M.C. and Maggio, L.A. 2013. Expert searcher, teacher, content manager, and patient advocate: an exploratory study of clinical librarian roles. *Journal of the Medical Library Association : JMLA*. 101, 1 (Jan. 2013), 63–72.
- [31]. The Institute for Prospective Technological Studies: <http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=6359>. Accessed: 2017-07-07.
- [32]. Area, M. and Guarro, A. 2012. La alfabetización informacional y digital: fundamentos pedagógicos para la enseñanza y el aprendizaje competente. *Revista española de Documentación Científica*. 35, Monográfico (Jul. 2012), 46–74.