SEPTIEMBRE/DICIEMBRE,
2016, VOL. 30, NÚM. 70,
MÉXICO, ISSN 0187-358X

Investigación Bibliotecológica

ARCHIVONOMÍA, BIBLIOTECOLOGÍA E INFORMACIÓN

ibi

Investigación Bibliotecológica

ARCHIVONOMÍA, BIBLIOTECOLOGÍA E INFORMACIÓN

30 (70), Sept./Dec., 2016, México, ISSN: 0187-358X

Universidad Nacional Autónoma de México
Instituto de Investigaciones Bibliotecológicas y de la Información

Contents

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), SEPT./DEC., 2016, MÉXICO, ISSN: 0187-358X

COMMENTARY

ARTICLES

Investigación Bibliotecológica: archivonomía, bibliotecología e información / Universidad Nacional Autónoma de México, Centro Universitario de Investigaciones Bibliotecológicas. vol. 1— , no. 1— , (ene./jun.)— . – México : Universidad Nacional Autónoma de México, Centro Universitario de Investigaciones Bibliotecológicas. 1986- . ISSN 0187-358X

Issued twice annually from vol. 1, no. 1 (Jan./June, 1986) to vol. 21, no. 43, (July/Dec., 2007).

Issued quarterly from vol. 22, no. 44 (Jan. /April, 2008) onward.

Because of the change in name from Centro Universitario de Investigaciones Bibliotecológicas to Instituto de Investigaciones Bibliotecológicas y de la Información in March 2012, volumes 26, no. 57 (May/Aug., 2012) and onward of the journal are published by the Instituto de Investigaciones Bibliotecológicas y de la Información of UNAM.

Investigación Bibliotecológica: archivonomía, bibliotecología e información. Vol. 30, number 70, September – December 2016, is published four times per year by the National Autonomous University of Mexico, Ciudad Universitaria, Delegación Coyoacán, Ciudad de México, C.P. 04510, through the auspices of the Instituto de Investigaciones Bibliotecológicas y de la Información, Circuito Escolar s/n, Torre II de Humanidades, Piso 12, Ciudad Universitaria, Col. Copilco, Del. Coyoacán, Ciudad de México, C.P. 04510, Tels. 56230360 and 56230337, http://rev-ib.unam.mx/ib, Email: revista@iibi.unam.mx. Party responsible for publication: Dr. Salvador Gorbea Portal, drevista@iibi.unam.mx. All rights and uses reserved under certificate: No. 04-2016-041813344600-203, ISSN: in process, both granted by the National Copyright Institute. Responsible for the latest update of this issue, Dra. María de Jesús Madera Jaramillo, Instituto de Investigaciones Bibliotecológicas y de la Información, Circuito Escolar s/n, Torre II de Humanidades, Piso 12, Ciudad Universitaria, Col. Copilco, Del. Coyoacán, Ciudad de México, C.P. 04510, Tel. 56230360 y 56230337, last update, November 2016.

JOURNAL INDEXED IN:

- Thomson Reuters Web of Science
- SSCI
- Índice de Revistas Mexicanas de Investigación Científica y Tecnológica del CONACyT
- ELSEVIER
- JCR
- SciELO
- SciELO Citation Index
- Scopus
- CSIC e-revist@s
- CLASE
- INFOBILA
- DOAJ
- LISA
- LISTA Full Text
- Latindex

This journal is published online:

- Revista IIBI: http://iibi.unam.mx/revista.html
- RevistasUNAM: http://www.revistas.unam.mx/index.php/ibi/index
- SciELO: http://www.scielo.org.mx/scielo.php?script=sci_serial&pid=0187-358X&lng=es&nrm=iso
- ELSEVIER: www.elsevier.es/unam/investigacionbibliotecologica

CONTRIBUTING RESEARCHES :

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), Sept./Dec., 2016, México, ISSN: 0187-358X

Alicia Arias Coello
Facultad de Ciencias de la Documentación. Universidad Complutense de Madrid. Calle Santísima Trinidad, 37 Madrid 28010 (España). aarias@ucm.es
Tfno: +34913946668

Ana R. Pacios
Profesora Titular
Departamento de Biblioteconomía y Documentación
Universidad Carlos III de Madrid
Getafe (Madrid)
Tel.: 34 91 6249225
areyes@bib.uc3m.es

Artemisa M. Reyes Gallegos
Académica en la Facultad de Música de la Universidad Nacional Autónoma de México y arpista principal en la Orquesta Sinfónica del Instituto Politécnico Nacional (México). Dirección: Xicoténcatl 126. Col. Del Carmen, Coyoacán. CP 04100. Ciudad de México Tel. 56883308 Correos electrónicos: artemis.rg@comunidad.unam.mx; areyesgal@ipn.mx

Carlos Miguel Tejada Artigas
Profesor Titular Universidad. Departamento de Biblioteconomía y documentación. Facultad de Ciencias de la Documentación. Universidad Complutense de Madrid
cmtejada@ucm.es
Facultad de Ciencias de la Documentación. Calle Santísima Trinidad 37. 28010 Madrid
Teléfono: 34.91.3946722

Carmen Díez Carrera.
Profesora Titular de Biblioteconomía y Documentación
Universidad Carlos III de Madrid carmen.diez@uc3m.es
c/ Madrid, 126
28903 Getafe (Madrid) España

Clara Simón Blas
Departamento de Estadística e Investigación Operativa. Universidad Rey Juan Carlos. C/ Tulipan s/n. Mostoles 28933. (España). clara.simon.blas@gmail.com.
Tfno: +34914888124

Evelia Luna Morales
Cinvestav, Servicios Bibliográficos, Avenida IPN #2508, Colonia San Pedro Zacatenco, México D.F. eluna@cinvestav.mx
5747 3800 Ext. 1776

Francisco Collazo Reyes
Cinvestav, Departamento de Física, Avenida IPN #2508, Colonia San Pedro Zacatenco, México D.F. fcollazo@fis.cinvestav.mx
5747 3800 Ext. 3825

Hamilton Rodrigues Tabosa
Universidade Federal do Ceará. Departamento de Ciências da Informação.
Av. da Universidade, 2853 - Benfica, Fortaleza-CE. Brasil. CEP: 60020-181.
+55(85)3366.7697
hrtabosa@gmail.com

José Mauro Matheus Loureiro
Universidade Federal do Estado do Rio de Janeiro. Departamento de Estudos e Processos Museológicos
Av. Pedro Calmon. nº 550 - Prédio da Reitoria, 2º andar - Cidade Universitária - Rio de Janeiro-RJ. CEP 21941-901
+55 (21) 3938-5144
jmmloureiro@gmail.com

José Ramón Cruz Mundet.Profesor
Titular de Biblioteconomía y Documentación
Universidad Carlos III de Madrid
joseramon.cruz@uc3m.es

José Simón Martín
Instituto Universitario de Evaluación Sanitaria. Universidad Complutense de Madrid. Plaza de Ramón y Cajal s/n. Facultad de Medicina. Madrid 28040 (España) jsimon@ucm.es.
Tfno: +34913941423

Lina Escalona Ríos
Investigadora del Instituto de Investigaciones Bibliotecológicas y de la Información. Universidad Nacional Autónoma de México
Circuito Interior s/n, Torre II de Humanidades, Ciudad Universitaria, C.P. 04510, Del. Coyoacán, México, D.F.
lina.escalona@gmail.com
(55) 56221881

Marcia Heloisa Tavares de Figueredo Lima
Universidade Federal Fluminense, Niterói RJ
Rua Lara Villela 126 sala 6
Ingá, Niterói,
24210-590
Tel.: 26299758
marciahelolima@gmail.com

María Elena Luna Morales
Cinvestav, Servicios Bibliográficos, Avenida IPN #2508, Colonia San Pedro Zacatenco, México D.F. meluna@cinvestav.mx
5747 3800 Ext. 1778

Miguel Romeu Amorim Neto
Universidade Federal do Rio de Janeiro, Rio de Janeiro RJ
Av. Pedro Calmon, 550 - Cidade Universitária, Rio de Janeiro - RJ, 21941-901
Tel.: 55-21-3938-1827
miguel@sibi.ufrj.br

Paulina Szafran
Profesora Adjunta del Departamento de Información y Sociedad. Instituto de Información. Facultad de Información y Comunicación. Universidad de la República (UdelaR-Uruguay).
Dirección: Rodó 1866. Montevideo, Uruguay.
Teléfono: (00598) 99217689
Correo electrónico: paulina.szafran@fic.edu.uy

Perla Olivia Rodríguez Reséndiz
Investigadora
Instituto de Investigaciones Bibliotecológicas y de la Información
Universidad Nacional Autónoma de México
Dirección: Circuito Interior s/n, Torre II de Humanidades, piso 12, Ciudad Universitaria, C.P. 04510, Del. Coyoacán, México, D.F.
Teléfonos: 52 55 56230380
Correo electrónico: perla@iibi.unam.mx

Virgínia Bentes Pinto
Universidade Federal do Ceará. Departamento de Ciências da Informação.
Av. da Universidade, 2853 - Benfica, Fortaleza-CE. Brasil. CEP: 60020-181.
+55(85)3366.7702
bentespinto@yahoo.com.br

Commentary

A new theoretical perspective of Bibliometrics based on the historical dimension and temporal referents

http://dx.doi.org/10.1016/j.ibbai.2016.10.001

The theoretical development to date in the field of Documental Information Metrics Studies has focused on the definition of the diverse metric specializations, as well as the similarities and dissimilarities existing between them resulting from the uniqueness of their respective sub-fields and objects of study.

The emergence of these specialized areas of metrics that include Librametry, Bibliometrics, Archivometrics, Informetrics, as well as others such as Sciencometrics, Webometrics and more recently Altmetrics, share a conceptualization process involving the application of mathematical and statistical methods and models to the activities of librarians, bibliographers, archivists, informative scientists, research scientists and social relationships on the Web and to other social media applications, and to a broad variety of communicative activities carried out online.

Bibliometrics is the oldest of these specialized metrics both in terms of practice and theoretical-conceptual development. As its name suggests, it is devoted to studying and identifying the quantitative regularities of the Documental Information Flow and the associated processes of Production and Scientific Communication. However, this classic or descriptive orientation has had to give way to new dimensions as the field matures, in order to include evaluative and historical processes, in which traditional objects of study are supplanted, thereby complementing an approach determined by securing results.

In view of this dilemma, an important thing to consider as a fundamental object of study is time. Analogous to the results of demographic analysis, time in bibliometric analysis determines the orientation or dimension of the process of achieving results derived from bibliometric analysis. This shift in the object of study of Bibliometrics arising from the time factor has never been studied. Also pending is the development of a new theoretical perspective of Bibliometrics from the basis of an analysis of time as the central axis integrating the three previously identified dimensions in this metric specialty.

In order to support this change in focus in the theoretical perspective of Bibliometrics, it is important to perform an array of research oriented to such ends. This is why this author is working on a line of research aimed at identifying to what extent the determination of the temporal referents of the bibliographical variables of the documents contributes to the development of a new theoretical perspective of Bibliometrics that is distinct from the approaches that until now have served as the foundation of the specialization's descriptive, or classic, evaluative and historical dimensions.

To this end, the three-dimensional character of Bibliometrics has been undergoing a process of identification and definition accross a wide-variety of approaches, leading to the prospect of determining a three-dimensional theoretical model for Bibliometrics.

The three-dimensional nature of Bibliometrics and its temporal referent

Of the metrics areas indicated above, Bibliometrics has undergone the greatest conceptual development as well as enjoying a broader range of practical application. Moreover, Bibliometrics research has been done across a wider variety of subjects, and geographic and temporal spheres than that performed in any other area of informational metrics and scientific knowledge.

Bibliometrics –originally conceived by Otlet in 1934-- was subsequently redefined by Pritchard (1969) as: The application of statistical and mathematical methods to books and other means of communication. This definition is later taken up and expanded by Pritchard and Wiittig (1981), who point out that this specialty metric ...includes all studies that use or discuss statistical analysis of data related to printed communication

(...) studies of individual elements within works (...) the measurement of the process of information transfer and its analysis and control.

In this first stage of development, bibliometric research with this theoretical approach is recognized as descriptive, or classical, because of its use of the classical mathematical models of Lotka, Bradford, Zipf, Price, Brookes, and the like, which serve to model and determine researcher productivity, information concentration-dispersion, word frequency in texts, the exponential growth of science and obsolescence of scientific journals, respectively.

Another theoretical approach of Bibliometrics arises in 1976, when Narin's work introduced Evaluative Bibliometrics as: ...the use of bibliometric techniques, especially the analysis of publications and citations, in the evaluation of scientific activity. From our point of view, this approach focuses on the study of the generation and use of bibliometric indicators oriented to the evaluation of communication and collaboration among groups, communities and scientific institutions. Through the evaluation of institutions, communities, groups and human resources devoted to scientific activity, the results obtained in this dimension provide complementary knowledge for interpreting the sociological behavior of scientific activities.

Finally, a third dimension is highlighted by Hérubel in 1999, when he defines Historical Bibliometrics as: the study of books and journals framed in time and space. However, the use of the temporal and spatial referents contained in this definition are not exclusive features of Historical Bibliometrics, but rather are posited, from our viewpoint, as essential to any research performed in any of the three Bibliometrics dimensions identified, whether descriptive, evaluative or historical.

In this sense, using sources and historical-bibliometric indicators to identify their main regularities, the historical dimension or quality attributed to Bibliometrics should be oriented to identifying patterns of quantitative behavior on the History of Science and to the main facts that describe the scientific development of an era. Its most significant association, in the orientation of its results, identifies with the Philosophy and History of Science.

http://dx.doi.org/10.1016/j.ibbai.2016.10.001

These three dimensions attributed to Bibliometrics allow the design of an integral model entailing three distinct approaches to obtaining results, and, in turn, the use of different sources, variables, indicators and purposes that can be represented in a new theoretical model of Bibliometrics.

From this three-dimensional vision of Bibliometrics forking into different subjects of study, a new approach arises that proposes integration and consolidation of these three analytical dimensions through the use of the temporal reference. This approach has as its purpose the development of a new theoretical perspective in which the temporal referent constitutes the central axis of bibliometric analysis in a way similar to what is done in demographic analysis of population studies.

Previous conceptual and terminological conclusions regarding the temporal reference of scientific production and communication can serve as a basis for developing a new theoretical perspective of Bibliometrics in which its three dimensions are integrated through the analysis of the temporal referents of production and communication, as well as the argumentation of its historical dimension, oriented to the contribution of new approaches that strengthen its three-dimensional character and its integral analysis.

To build this new approach we employ conceptual comparison and contrast to determine a priori the distinctive aspects of the descriptive, evaluative and historical dimensions of Bibliometrics. This serves to provide theoretical elements that contribute to their redefinitions. We must also revise the definition of Historical Bibliometrics by analyzing the temporal referent in this type of study in order to contribute to new approaches to its conceptual foundations. Taking a cue from demographic analysis models, we must employ the temporal referent as the main unit of measure in the transversal and longitudinal bibliometric analysis of the data.

The construction of a new approach in the theoretical outlook of Bibliometrics must be governed by basic principles including the following: the documents and associated relationships of production and scientific communication are generated at a specific moment and they endure in form and content over a historical period; and --in a way analogous to what happens

http://dx.doi.org/10.1016/j.ibbai.2016.10.001

with the individuals authors-- they have and fulfill a certain age every year of their lives. For bibliometric analysis, time, from this perspective, constitutes the fundamental unit of measure by which the behavior and regularities of scientific production and communication can be ascertained. The analysis of the temporal referent in these regularities determines in a way that is directly proportional the results obtained in the three dimensions of Bibliometrics; therefore, it modifies the theoretical foundations on which the bibliometric analysis currently rests.

This new approach must begin with the quantitative examination of the effect of time, as the unit of measurement (an aspect has not been used in bibliometric studies) on the bibliographic variables that intervene in the processes of scientific production and communication, in order finally to establish the events that explain a new theoretical perspective in this specialized area of metrics.

To this end, we start with the temporal analysis of each and every one of the events and regularities involved in the processes of scientific production and communication (production, edition, reprint, compilation, productivity, concentration, dispersion, aging, use, disuse, referencing, citation, impact, visibility). This is achieved through transversal design that collects data at a point in time and the longitudinal design consisting of collecting data at different points over time, thereby allowing inferences to be made about the evolution of the causes and their effects on the processes mentioned above.

For this kind of analysis and design, we must use the three systems of variables that are identified in the bibliometric analysis, i.e., 1) the variables of bibliographic entries and records; 2) references and citations, and 3) those associated with authors, groups, communities and institutions.

The analysis of these three systems of variables must be performed in a way similar to that used by Brookes in the study of obsolescence: synchronous, multi-synchronous and diachronic; i.e., retrospective at a point or moment in time, retrospective at multiple points or moments in time, and projective into the future, respectively. To facilitate these types of analyses, it is useful to employ a model frequently used in demographic analysis. This model is a powerful quantitative analytical tool known as the Lexis Diagram, in which time is used as the determinant unit of measure.

This interaction between bibliometric and demographic analysis once again confirms the general trans-disciplinary nature of Information Metrics and Scientific Knowledge, a nature shared by Bibliometrics, while at the same time allowing us to corroborate the reliability of the use of mathematical models and methods in the determination of the theoretical constructs that underpin research in this field of knowledge.

Salvador Gorbea-Portal

Para citar este artículo:

Gorbea Portal, Salvador. 2016. "Una nueva perspectiva teórica de la bibliometría basada en su dimensión histórica y sus referentes temporales." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 11-16.

http://dx.doi.org/10.1016/j.ibbai.2016.10.001

Information, communication and culture under local management: the municipality experience in a socially vulnerable neighborhood of Montevideo

Paulina Szafran

*Received:
July 29, 2014.
Accepted:
February 24, 2015.*

Abstract

The paper describes an experience in a neighborhood known for its social vulnerability in the City of Montevideo, Uruguay, The recent establishment of municipalities as a third level of government prompted this research into how information, communication and culture operate under the local management of Municipality F, and how these activities are viewed by local actors. Within this scenario, the role of the public library is described, stressing the specifics of services delivered locally. The research methodology entailed interviews with persons connected to municipal management of the area under study and analysis of documentation produced and disseminated by that body.

* Universidad de la República (UdelaR-Uruguay), Montevideo, Uruguay.
paulina.szafran@fic.edu.uy

Keywords: Municipal Management, Local Policies; Public Libraries; Information, Communication and Culture

RESUMEN

Información, comunicación y cultura en la gestión local: la experiencia municipal en un territorio de vulnerabilidad de la ciudad de Montevideo
Paulina Szafran

El artículo describe una experiencia desarrollada en un territorio de la ciudad de Montevideo, Uruguay, caracterizado por su vulnerabilidad social. A partir de la reciente conformación en el país de los municipios como un tercer nivel de gobierno, indaga cómo funcionan en la gestión local del Municipio F la información, comunicación y cultura y de qué modo son concebidas por los actores municipales. Aborda en este contexto la percepción sobre la biblioteca pública en tanto servicio local. La metodología se sustentó en entrevistas a personas vinculadas a la gestión municipal de la zona de referencia y en el análisis de la documentación generada y difundida por dicho órgano.

Palabras clave: Gestión Municipal; Políticas Locales; Bibliotecas Públicas; Información, Comunicación y Cultura.

University research in Library Science oriented to social inclusion

From the diverse fields of actions available to the library science researcher working in any given area, approaches that examine daily reality, accompanying historical processes that contribute to disciplinary development with a social vision while helping improve the quality of life of citizens take on special significance.

Despite the fact that "Latin American library science literature published across the twentieth century shows the notorious relationship between

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

'public libraries and vulnerable communities,' this was never one of the main focuses of theoretical and empirical research, despite these social groups being visible to practically all of society."[1] It is possible to have valuable antecedents from the context of the university, linking library science teaching in Uruguay, regarding the study and action in the field, including development of experiences in information services that have not been promoted by natural agents in charge, such as local and national governments.

This conception is enriched from the process that allows the recent creation of the Faculty of Information and Communication (FIC) of the Universidad de la República, a new university center where information and communication sciences converge and where the Research Group in Information and Communication for Social Integration and Inclusion (GIISUR) is constituted.[2] This group is oriented toward consolidating a multi-interdisciplinary line of research, taking a its guiding axis that information and communications are devoted to vulnerable sectors, which emphasizes research based on the a reality that needs to be transformed, conceived as a supply for promoting information policies directed at citizens. Likewise, it seeks feedback from the technical body of the domains involved, generating interdisciplinary knowledge in theory of information and communication. Considering the previous development in the Zonal 9 territory of the City of Montevideo[3] on the part of the Department of Informationa dn Society of the ex Eubca (Escuela Universitaria de Bibliotecología y Ciencias Afines), currently called the Instituto de Información, targeting adolescents and young people of a vulnerable context, GIISUR performed a study during the period of 2010-2012, in the same zone, referring to the process of information-communication of the public health policies centered on adolescents.

This approach was framed by recent public policies that are being implemented in Uruguay, especially the National Integrated Health System and those issuing from the AGESIC (Agencia de Gobierno Electrónico y Sociedad de la Información) and Digital Agenda. The current climate of the country is ripe for the university to promote the generation of knowledge, supported by the medium, inducing feedback with the parties responsible for setting and executing policies. From this standpoint, it is important to

1 Felipe Meneses Tello, "Bibliotecas y sociedad: el paradigma social de la biblioteca pública", 167.

2 The research group in charge the project "Las estrategias de información y la comunicación centradas en los jóvenes y ado lescentes en el ámbito de la salud: análisis y propuestas (RAP-ASSE, Zona 9 de Montevideo)" Performed from 2010 to 2012, coordinated by professors Martha Sabelli, Jorge Rasner and Raúl Ruggia; referent international professor Juan José Calva González.

3 Martha Sabelli y Verónica Rodríguez Lopater, La información y las jóvenes en contextos desfavorables: construyendo puentes para la inclusión social desde la investigación.

redouble research efforts in the discipline that promote professionalization in the appropriation of the possibilities the new policies offer to the inhabitants.

Starting from this configuration, a contextualized contribution is presented within the broad and varied field of the relationship between information and citizen, which is based on the idea that citizens "are also a deciders; they take decisions with regard to multiple problems that they must face in their jobs, within the community and with regard to family";[4] and that, in accord with the author's idea, it is conceived as a member of groups, in this case located in local spheres and not as an isolated individual; therefore, a member of a community of practice in the access and use of information. From the standpoint of Library Science, this approach to the communitarian niches has had a transcendental value in the construction of object of study.

Currently, the incorporation of the concept of community engagement (CE) to the development and evaluation of the programs erected to to contribute a perspective aimed at the function of the library science professional in social inclusion, promotion of democracy and the contribution to social/human/cultural capital.[5] In this way a line of research aimed at analyzing library science and its role with respect to CE, addressing the dissemination of communitarian information and the use of its space to take decisions.

During 2013, an experience of GIISUR unfolded that allows for the broadening of the actors with which it had worked in the Zonal 9 territory of the City of Montevideo, currently municipality F; youths and adoclescents in vulnerable circumstances and mediators of local services, including librarians.[6] Faced with possibility of deepening the inquiry in the aforementioned territory, they opted to add a vision of the politicians and technicians linked to municipal management.

To speak of citizens and information in the local context necessarily entails the correspondence of the organization that historically focuses on these referents, the public library. Near the end of the paper, the political dimension of public library is reaffirmed, [7] as is its decisive role in the training of the citizen,[8] addressing the role of information and knowledge as an

4 Martha Sabelli, La información y el ciudadano en el entorno de la Sociedad de la Información: percepción de los actores políticos y sociales en el Uruguay, 58.

5 Hui-Yun Sung, Mark Hepworth y Gillian Ragsdell, "Investigating essential elements of community engagement in public libraries: an exploratory qualitative study".

6 Martha Sabelli y Jorge Rasner, Informe final. Las estrategias de información y comunicación centradas en Los jóvenes y adolescentes en el ámbito de la salud: análisis y propuestas (RAP-ASSE, Zona 9 de Montevideo); Martha Sabelli, "Investigaciones sobre el comportamiento informativo de adolescentes y jóvenes en situación vulnerable: hacia una información inclusiva en Uruguay".

7 Orlanda Jaramillo, "La biblioteca pública, un lugar para la formación ciudadana: referentes metodológicos para el proceso de investigación".

8 Orlanda Jaramillo, Biblioteca pública, ciudadanía y educación social.

instrument of the exercise of citizenship,[9] while conceptualizing information as an object of study that facilitates an integral, interdisciplinary perspective.[10] It also requires contextualization of the participating actors as members of the process of information transfer. Let us remember the

> "human beings are by nature information users, because they both generate information and use it, and as users of information they belong to diverse social sectors. As such one may arrive at a typology of the same in accord with the social sector to which they belong."[11]

In this sense, it is interesting to quote Jaramillo insofar

> as he posits the public library from the dimension of the citizen implies adopting a definition that goes beyond the simple conception of facilitating access to information and knowledge, and that also posits and boosts actions and links that make training of the subject, the citizen, possible with the capacities of demanding and exercising their rights, but also in order to fulfill their duties that arise from these in the pretension of training the citizen, which is not only a consumer of information but also producer, transmitter and communicator of information and knowledge. [12]

This aspect becomes transcendent when examining the Uruguayan context insofar as it has a new situation in terms of decentralization promoted under Law 18.567 "Political decentralization and citizen participation" in February 2010, which created the municipalities as the third level of government, granting a special emphasis to the local scene, a relevant platform for the analysis of the library services to the citizens.

Decentralization and the "local" as a scenario of action of public libraries.

The establishment of municipalities in Uruguay accompanies a tendency observed in other countries in Latin America that has local politics depend less on national authority. The institutional authority establishes the exis-

9 Orlanda Jaramillo, "La formación ciudadana, dinamizadora de procesos de transformación social desde la biblioteca pública".
10 Sabelli, "Investigaciones…".
11 Juan José Calva González, "Información y adolescencia: búsqueda de información por los adolescentes", 73.
12 Orlanda Jaramillo, Biblioteca pública…, 127.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

tence of the municipalities with authorities elected by the citizens and the instrumentation of actions that lead to local development, for example, participative budget.

Since the arrival of the leftist party, Frente Amplio (Broad Front), the government of the department of Montevideo in the year 1990 begins to implement a decentralization process that divided the capital of Uruguay into 18 districts. Each of these districts has a Communal Center Zone for administrative matters; a local junta comprised of the political administration and the neighborhood board that brings together neighbors and social organizations. This reorganization does not imply the constitution of a third level of government, a fact that materializes after the aforementioned law that created the municipalities. In these, the heretofore unknown figures in the country stands out: the mayor and the municipal council, which constitute local governments elected by the citizens.

To speak of the municipalities, places us in a new context of decentralization, understood (and differentiated from de-concentration) as "the transfer of functions, attributions, responsibilities and resources from the central organ of the State to a lesser organ."[13] According to Veneziano it is "an instrument to shift demands from central state organ to the periphery."[14] This author also presents diverse contradictory angles that entail the linking of "the living forces of the market" (with a redactor role of the State) to the "popular sectors" as well as the necessary articulation between poles that are "false dichotomies": State/Society; global/local; public/private.

The context proposed for the research, though focused on an specific territory, allows for the introduction of reflections on the role of the public library, proving the existence, like in other realities,

> of "the very insufficient integration of the public library in state and governmental public policy; policies that effectively articulate the plans, programs, projects and other actions directed at developing the public library and insert it it into the political life of people."[15]

Among the various types of decentralization,[16] it is interesting describe the territorial character (entailing functional and political decentralization),

13 Antonio Cardarello, "Muchas dudas, algunas certezas y escaso entusiasmo. Las elecciones municipales 2010 en Uruguay", 65.

14 Alicia Veneziano, Sustentabilidad política, reforma de Estado y participación ciudadana en la Intendencia Municipal de Montevideo, 2.

15 Orlanda Jaramillo, Didier Álvarez Zapata y Daniel Moncada P., "Políticas públicas para bibliotecas públicas: una propuesta de soluciones locales a problemas globales", 16.

16 Arocena citado por Cardarello, "Muchas dudas…".

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

which brings a transfer ofg duties of the first levels of management, the allocation of resources and the involvement of the civil society. It is a space that is riper for participation of citizens, not only from the electoral standpoint, but also through individual and group participation in politics in the sense of contribution to the development of public policies. In this same line, Veneziano contributes a conceptualization of the municipality "as a network linking the State, in its political territorial sense; the government, in the peripheral instance; and the political and socio-economic actors of the local society."[17] This idea of the municipalities as networks is shared by other authors and its serves to facilitate the understanding of the diversity of the protagonists and links that act at the local level, and aspect that is particularly important to examine with regard to the public library in terms of social and cultural service. In this framework, the outlook granted to the public library, its "essential ethos," become especially relevant in terms of the "social utility of the public library,"[18] as this relates to three substantial relationships: Library-community; library-town; library-society. Likewise, the location of the library as a space of political socialization[19] allows for an understanding of the role granted with regard to political identity, an instrument of the presence of the citizen in the public sphere.

Regarding recent practice (it must be noted that the first term, starting in July 2010, of the municipal administrations has not yet concluded) in Montevideo, the public libraries were still administrative dependencies of the departmental government, a second level bureaucracy. This fact, has not meant that the public libraries are relived of the need to work jointly with the local municipality, therein finding diverse experiences for interrelating in diverse areas of the city.

Methodological strategy

The framework described orients research questions applied to the municipality F of Montevideo. Taking the emphasis on information and communication as an axis, this research attempts to examine the whether the local contexts favor the articulation of policies in diverse areas and how local

17 Alicia Veneziano, Sustentabilidad política…, 2.
18 Felipe Meneses Tello, "Bibliotecas y sociedad…", 164.
19 Yicel Nayrobis Giraldo Giraldo, Gloria Elena Román Bentancur y Ruth Elena Quiroz Posada, "La biblioteca pública como ambiente educativo para el encuentro ciudadano: un estudio de la Comuna I de Medellín".

policies interact with departmental and national policies, as well as whether it is possible to identify public library policy within the municipality.

The methodology applied employs the benchmarks developed by GI-ISUR in the original project. This point of the inquiry entailed interviews with relevant persons in the municipal administration of Municipality F and the analysis of documentation and information disseminated by this organ.

Considering the areas of competence in municipal work and attending to the aims of the study, the interviews were directed a figures linked to social, cultural and communication tasks. Likewise, a special accent was granted to the political vision entailed in local work, with the interview of the mayor being an important element in the analysis.

On the basis of the aforementioned areas, seven interviews were conducted, breaking down as follows: two interviews with political actors; one with an actor in the cultural sphere; three with actors in the social sphere, and one with a person working in communication. The interview employed open question, allowing for extended dialogues.

Despite using an identical script in all of the interviews, at the time applied it was adapted to the job profile of the person interviewed. The thirty-four questions were organized in six blocks as follows: identification of interviewee; data referring to the workplace; the description of Municipality F; interviewee's description of job functions and activities of Municipality of F; university activity in the zone; and interviewee's appreciation of the local administrations. In the latter point includes an inquiry into the interviewee's perception of the public library policies and other policies associated with information and cultural matters. The interview delved into those answers addressing information and communication in the Municipality and with regard to the citizen.

The documental analysis examined the municipal communication media, with an emphasis on the weekly news bulletin which gathers all of the information linked to the municipality. This bulletin offers subscriptions and is delivered via email, which contains news headlines linked to the Municipality F website. The newsletter includes a section with news from other municipality. The subscription to the news bulletins allows one to see the amount of activities promoted by the local organ. In the period of September 2013-February 2014 this research examines 26 news bulletins.

The complex web of the local administration

The experience deepened the knowledge of the zone characterized as extensive, diverse and with many vulnerabilities. The data gathered shows an

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

infantilized population, high incidence of poverty and lack of services. With this macro identification it is possible to understand the perspectives presented by the diverse sectors of the municipal administration and how beyond the benchmarks each specific region claims its particularities and need to strengthen strategies to get closer to neighbors.

In light of the description above, it is important to understand the selection criteria for the topics addressed. The Municipal Plan for the Development of the Municipality[20] expresses the purposes, objectives, strategies and actions to be implemented. It cites four lines of action aimed at the great themes: infrastructure, environment, social integration and economic production. Following the specificities of this type of agency, this documents shows the multiplicity of the axes of action, covering diverse items of the territory. The first proposals in the 2011 annual operational planning guide include roads. For the aims of this research purposes, we focus on the following three operations carried out by the head of Communications: "To develop information socialization strategies in the Municipality"; and "To generate and strengthen communication channels"; Create and implement a municipal communications area." Even though the Communications area proposes for itself the task of "Promoting the development of cultural enterprises and citizens' centers," the description of activities cites many services without any mention of public libraries. It is worth noting that in the Municipal Development Plan names many participating organizations linked to the territory, without making any mention of libraries. This suggests that the plan was developed without taking libraries into account in anyway whatsoever.

Doubtless we live in a time in which localness is promoted from diverse areas, increasing the competencies and duties of local governments, often without providing the instruments local governments will need to fulfill their functions and, as such, limiting their possibilities despite the expectation they generate. According to De Barbieri,[21] localness assume there is a territory with a sense of shares identity and meanings among the inhabitants. As such the territory allows for the coexistence of multiple rationales and entails a permanent effort of negotiations among the diverse logics of action. This requires participants in the local government to take on a role beyond simple administrators and the citizenry to transcend its habitual attitude of simply demanding services.

20 Municipio F, Plan Municipal de Desarrollo.

21 María de Barbieri, Ioanna Grotiuz, Alejandra Marzuca and Graciela Viera, Estrategias de descentralización en Uruguay: sobre los gobiernos locales y la importancia de la dimensión política, de gestión y socio-política para la gobernanza territorial.

This panorama is reflected in the daily practices of the territory. The members of the municipality under study assert that the creation of the municipality is an important step, because before this event they worked only as administrators of the policies handed down from higher levels of government. In this new situation, the local administration makes decisions and enjoys larger, but insufficient, budgets. Likewise, this recent scenario has provoked some tension, because of the rapid implementation of the flaming system and because of the lack of preparation of the main political actors charged with implementing the tools of administration. One of the interviewees pointed to the difficulty of not being able to achieve "a nearby government" insofar as it is assumed that the new municipal model would be closer to the people than the earlier model; that is, despite recognizing greater contact with the population, it is not enough.

With regard to a topic the directly affects the management of public libraries, both in terms of their administrative dependency and their potential role in local information services, this study examines the articulation of national, departmental and local policies in the territory under study. On this point, there is agreement about the need for more integration, a fact illustrated by numerous examples of programs promoted from the departmental level that do not address what the local population has point to, about which one respondent said: "that tension between decentralization and centralization is palpable." Another affirmation reveals the fragmentations that an identical space can provoke: "you have three or four programs running at the same time, totally uncoordinated, it is a duplication of efforts and waste of money." Moreover, with regard to a recent experience, one can see that the relationship with the executive branch exists through the intendancies, and not yet through the municipal governments. We see, then, an aspect reframed in the topic under examination: the incidence of the personal features of those involved, in this opportunity with reference to the links of the mayor with the intendant.

With respect to Municipality F, the team assumes as a an axis for its internal work the complementarity and articulation of the areas of action, since the concrete action in the territory is ongoing entails the coexistence of diverse programs without adequate coordination.

Taking an inside look at the dynamics of the practice in the territory, we take a description made by the cultural sector. The cultural administrator works with the neighborhood commissions and the cultural centers under a mixed management format that is not systematically set because there are dissimilar models. In conjunction with the neighborhood commissions, it works to strengthen these places, something which demands a lot of work.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

"The success of the efforts depends more on the neighborhood commissions, on the willingness, on the participation, on the militancy of neighbors than on the efforts of the State. They are the agents of action, they open, close, clean up, etc." At the same time, the interviewee describes other complexities of contact with citizens: "After meeting with neighbors, they say what the rest of the neighbors feels, here to the neighbors, culture is not important." The representativeness is a complex topic. Sometimes there are opinions that are not held collectively, but are nonetheless proffered by those who lead the commissions.

The experience with regard to public libraries

Despite the vastness of the territory under study, library services are quite scarce and this can explain why they are not even considered in the Municipal Plan described. There are three public libraries in the zone, two managed by the department of the Intendancy of Montevideo (la Biblioteca Pública Francisco Espínola and la Biblioteca Pública Francisco Schinca, which also belong to another municipality) and one that is a dependency of the Ministry of Education and Culture (Biblioteca José Batlle y Ordoñez). There are also several popular libraries, but as is commonly the case in Uruguay it is impossible to determine just how many operate within the precinct.

By linking the municipal topic with information policy, interviewees were queried about the role of public libraries as local information cente3rs and the situation in the zone. The actors in Municipality F perceive the libraries and posit diverse functional modalities stressing the ongoing difficulties of limited hours of operations offered in these libraries. In one specific neighborhood, the interviewees from the social area said that they have discussed with neighbors the role of the library, because these neighbors had said that it is significant the library be invited to participate: "It is a benchmark space and it must be." In this specific case, the public library in the zone had over the course of several years developed a work experience with the community, especially with regard to the management with neighborhood organizations. This was something promoted by the professional in charge of the library, and an experience that remains in the memory of its members.

The interviewees singled out the Biblioteca Francisco Schinca, which thanks to its new head[22] has been especially active in the neighborhood,

22 Since December 2012 the library is led by a professional hired by means of a job notice posted by the Intendancy of Montevideo targeting Library Science degree holders.

incorporating other elements such as recreation and education. Once again we see that the attitude of the head librarian is key to the library's function, to which we can add professional commitment. Referring to the importance granted in Latin America to local governance, Revesz claims in this context an attitude in agreement with the librarian: "More than at any other time, a lot of what is possible and the results expected depends on the capacity of the librarian to be more than another functionary, technician between four walls or administrator of resources, but also to be an advocate and an ambassador of their institution before the world."[23]

The worker linked to cultural management in the territory understands that it is feasible to recognize library policies not only from the standpoint of finding materials or the renewal of the library, and opining that the book can no longer be the basis of its mission: "we must seek new methods [...] we must generate activities such as those developed by Schinca, which have to do with the book, which have to do with reading but that not is going to look for a book, that is what is going to make the library function, that has enormous potential." The interviewee describes a panorama more critical with regard to popular libraries, in light of the presence of users and the need to modify the forms of administration: "it has to do with the management and with handing over management of the public library to the neighborhood junta."

On the basis of the vision of one of the political actors, the lack of resources is posited as a limiter on development of libraries in the zone, which has repercussions on a feature of the territory: the lack of space. An anecdote can serve to illustrate this idea: A child in a neighborhood of the zone announced his intention on Facebook to start up a library in the neighborhood. In this way, he was able to collect quite a large number of books, but his mother called the municipality because she had no place to keep so many books in her house. The municipality came by and picked up the books but was only able to take them to another house. Faced with the lack of locales, they endeavored to acquire a library bus and they were successful, but no one was hired to work on the bus and no diligences were made to hire anyone. The end product is a bus filled with books but because of lack of budget without the personnel needed to actually provide services.

Regarding the matter of citizen access to information, the mayor himself stated that perhaps there are conditions to favor it that they have not known how to develop. In the course of the interview he comments that it might be

23 Bruno Revesz, "Políticas de información, bibliotecas públicas y desarrollo local y regional", 58.

possible to incorporate computers in the municipality for the neighbors to use. The fact allows one to assume that the recognition of the value granted to information for the citizen is not understood a priori linked to the public library, but moreover, there is an open position to being able to materialize actions that do not imply an important deployment of resources, a scenario in which is it crucial to have the initiative of the professional librarian. Reiterating Jaramillo's[24] line of thought, there is no doubt participation as a citizen practice requires certain condition of the both the citizen and the library.

From the standpoint analyzed it is interesting to posit the challenge posed to public library by this new institutional condition, highlighting its role with regard to political education, presented by Ríos Ortega: "The elections of representatives, and in general participation in public life built around the State and a system of government, implies appropriation of public knowledge and information. Therefore, it is essential to underline that the citizenry also requires political education."[25] However, it is hard to discern this admission in this outlook of reality insofar as, despite the potentialities of public libraries, the scant incidence of library services for the citizens of Zona 9 has already been established.[26] This especially true for adolescents and youth people.[27]

Communication applied to municipal administration

The communications axis is revealed exhaustively in the interviews, in the understanding that this is a transversal issue that cuts across diverse areas of work. The competence of the sector is vast, with a greater emphasis on the use of TIC. The area of communication generates contents of the institutional webpage and its social networks (Facebook, Twitter and YouTube), and it edits and sends the weekly news bulletin via email (to subscribers). It also publishes a free, online journal released on average five time each year and distributed by the members. Other points are centered on participation in community radio programming in the zone and making posters which they post for the public in Municipal F and the Zonal Communal

24 Orlanda Jaramillo, "La formación ciudadana…".
25 Jaime Ríos Ortega, "El acceso abierto a la información y la formación ciudadana", 142.
26 Paulina Szafran Maiche, "Recursos de información para la ciudadanía: documentos, servicios de información y comunicación".
27 Jimena Núñez Ansuas, "Servicios de información en la Zona 9 y las políticas de información en salud destinadas al público joven".

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

Center.[28] It also develops a joint process involving university personnel and the Bien de cerca (Quite close) radio show of the Communication Institute of the FIC, a municipal promotion program. No less important is the attention to varied requests that they receive, insofar as the possibilities, often without having the resources needed to resolve them; a common example is the request for poster to advertise diverse actions.

Most of the instrument reviewed were analyzed from the standpoint of the purpose of the study, especially the news bulletin. This examination lines up with the findings of the interviews. News items on the activities of the Municipality F are presented as these relate to local politics, including reports on traffic, roads, lighting and pruning. Moreover, the bulletin disseminates diverse information on local cultural groups, which places cultural matters as the subject of much promotion.

Addressing the thematic areas, some are identified with defined themes, for example, social, culture; others, as it is desirable in the execution of tasks, involve various themes, so it is not possible to group them in a determined category. One type is of singular interest because of the context of application, are the activities performed in the Biblioteca Francisco Schinca, as the program called the La Infancia es Capital (Childhood is capital).

The analysis confirms the assertions made in the interviews regarding the coverage of activities. Some cases only report on realization, while other disseminate it after carrying them out by interviewing participants, comments, etc. Some news is announced once, while others news is repeated for several weeks. This fact obeys the importance of the matter, such as the election of neighborhood councils and information on the participative budget that are aspects that they do to the local government. The time of year in which it is disseminated also exerts an influence; for example, in the month of January news is often repeated, no doubt because of the scant number of activities scheduled in the month.

The period of coverage reveals that the type of information disseminated. In this way, during the month of December a lot of news is disseminated regarding closings and workshop shows held in the zone, while in the month of February the carnival is held and therefore information on parades in districts of the zone are repeatedly announced.

Because it is a point of particular interest, the Biblioteca Francisco Espínola is not mentioned even once in the bulletins examined, while the Biblioteca José Batlle y Ordoñez is cited only once e la and the Biblioteca Francisco

28 During the development of the project "Hacia la construcción de Servicios de Información a la Comunidad: estudio del acceso y uso de información por las mujeres de contextos desfavorables (Zona 9 de Montevideo)", the posters had already been identified by the service mediators of the zone as an important medium for disseminating information to citizens.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

Schinca (which shares territory with another municipality) is mentioned repeatedly, confirming the diversity of actions performed by this institution, a fact highlighted by the interviewees in every sphere. Communication is not exempt from doubts that are generated in the interviewees regarding municipal functions associated with approaching the neighbor, specifically referring to means employed and the dissemination media. In diverse section the information largely disseminated electronically is questioned, which means that it is received by persons with access, but not always in the places they wish. As such, it is a modality that needs to be improved. From the cultural area, its value in terms of how communication activities can determine the success or failure of the same is stressed. Besides these cited media, megaphones have also been used to announce cultural events.

The information-communication is presented in another example associated with municipal management, stressing the need to inform the populace about the third level of government, since the population's lack of knowledge about the new institution is faced every day, and it is something that is not entirely embraced by the work teams of functionaries, they understand that they are learning about it in the course of daily work.

Conclusions

The first approximation allows us to assert that the nascent context offered on the basis of the implementation of the municipalities as a third level of government, in view of the features of the territory, promises to favor greater degree of contact with the population of the zone, promoting their participation and granting more autonomy to local government. However, despite most interviewees view that the situation has improved, they have the feeling that more can be done. On one hand, as it occurs in all initial experiences, there are elements that are known about the course of events and that await refinement in the next administrative term. Likewise, there are situations that worry the benchmarks associated with the possibility of materializing in the events which embody the instrumentation of the municipalities. In this sense, having more resources becomes one of the main needs in order to correct and broaden many actions. This aspect, previously mentioned as relevant for decentralization, does not always correspond with what happens in practice and with the emphasis granted to current local management.

It is worth reiterating the convincement that it is not only an economic matter; it is also linked to two items that are posited repeatedly: the scant knowledge that exists regarding the implications of municipal government and the conviction that it is the characteristics of the leaders of initiatives and organization located in the territory that determine many of the particularities of the services and action performed therein.

Despite these problems associated with duplication of programs and resources, it is understood that the local context can serve as an articulator supporting the application of diverse policies, attending to the diverse matters involved and the levels of the organs in charge. The participating actors trust that the processes of implementation of the municipalities, especially the knowledge of what they imply, will be able to regulate these aspects and improve, even though it is not seen as an easy task.

Taking the example of the public libraries of Montevideo, it is possible to prove that the institutional structure itself moves in this direction, the erection of the municipalities has not altered their dependence on the Intendancy of Montevideo. As such, the link with local governments (in some cases such as the aforementioned Biblioteca Schinca, which serves territories belonging to more than one municipality) obeys other conditions, often limited by good or bad relationships between persons.

On the basis of the methodology developed, we did not find elements suggesting identifying library policies in the territory. However, it is interesting to stress that the interviewees recognize the importance of libraries and their particular range of local services, while granting them a role that goes beyond their traditional functions and conceiving them as social and cultural spaces that benefit the territory, even as the person heading up the same are largely responsible for the features of the services provided regard less of any policies that night be designed. At the same time, this is a point that ratifies the lack of resources, which is to say the lack of personnel, which entails the greatest criticisms, the reduced hours of operation and all of the consequences entailed by this. The question expressed by many interviewees of whether the idea of the library as a local service has anything to do with recent hiring of a professional librarian for the library in the zone, particularly whether the it is considered that the cited plan was drafted prior to this change in the library. This situation proves the expression of Meneses Tello: "what is done through the public library services and how it is done, in the web of diverse social groups, attains a high degree of importance."[29]

Information and communication as transcendent supplies in coming in closer contact with the population, valuable instruments for achieving effective participation that makes the essence of local administration and is con-

29 Felipe Meneses Tello, "Bibliotecas y sociedad…", 168.

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 19-38

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

ceived as something difficult to materialize. Even though said recognition is not directly linked to a library. The reiterated need for dissemination of the local government and the importance of the municipalities is not visualized with the presence of the library, i.e., there is no contrary position to this; therefore, any proposal in this sense would be appreciated. From this framework and in line with Rios Ortega, it would be possible to delve into the role, not because it is the library's job to generate information derived from administration of the government, but rather with regard to ensuring access to the public information: "as well as an expert guide that the citizen needs for its de-codification."[30] The conception posited of the citizen as a decider and member of a community entails for the effective materialization of instruments and the space of the public library as a favorable space to meet the neighbor: "From this perspective, this type of library must continue contributing around the world to develop more and better capacities and abilities among the members of the civil society for the exercise of their actions as citizens to carry out within their communities".[31]

According to the objectives proposed for this instance, the extension of the dialogue with the actors in the zone is worthy of note. The antecedents of the research stressed the high level of insertion achieved, something that was proven in this opportunity. Despite the connection with new interlocutors, knowledge of group work and actions performed in the territory does exist, which confirms the conviction that joint dialogue allows for intervention in reality for the purpose of transforming it because of the contribution of diverse outlooks that contribute know how.

30 Jaime Ríos Ortega, "El acceso abierto…", 143.
31 Felipe Meneses Tello, "Bibliotecas y sociedad…" 170.

References

Calva González, Juan José. "Información y adolescencia: búsqueda de información por los adolescentes", en *Memoria del Tercer Seminario Hispano-Mexicano de Investigación en Bibliotecología y Documentación. Tendencias de la Investigación en Bibliotecología y Documentación,* Filiberto Felipe Martínez Arrellano y Juan José Calva González (comp.), 73-89. México: IIBI, 2006. Fecha de consulta: 14 de julio de 2014, http://cuib.unam.mx/libros.html

Cardarello, Antonio. "Muchas dudas, algunas certezas y escaso entusiasmo. Las elecciones municipales 2010 en Uruguay". *Revista Uruguaya de Ciencia Política* 20 (1) (2011): 63-94. Fecha de consulta: 10 de junio de 2014, http://www.scielo.edu.uy/pdf/rucp/v20n1/v20n1a04.pdf

Carrillo, E. "La nacionalización de la política local". *Política y Sociedad* 3 (1989): 29-46. Fecha de consulta: 15 de junio de 2014, http://revistas.ucm.es/index.php/POSO/article/download/POSO8989230029A/30654

De Barbieri, María, Ioanna Grotiuz, Alejandra Marzuca y Graciela Viera. *Estrategias de descentralización en Uruguay: sobre los gobiernos locales y la importancia de la dimensión política, de gestión y socio-política para la gobernanza territorial,* Montevideo: Flacso Uruguay, 2010.

Giraldo Giraldo, Yicel Nayrobis, Gloria Elena Román Bentancur y Ruth Elena Quiroz Posada. "La biblioteca pública como ambiente educativo para el encuentro ciudadano: un estudio de la Comuna I de Medellín". *Revista Interamericana de Bibliotecología* 32 (1) (2009): 47-84. Fecha de consulta: 17 de noviembre de 2014, http://aprendeenlinea.udea.edu.co/revistas/index.php/RIB/article/view/2749

Herzer, H., P. Pírez. "Municipio y participación popular en América Latina". *Desarrollo Económico* 29 (114) (1989): 187-205. Fecha de consulta: 19 de junio de 2014, http://www.jstor.org/stable/3466961

Jaramillo, Orlanda. *Biblioteca pública, ciudadanía y educación social,* Buenos Aires: Alfagrama, 2013.

"La formación ciudadana, dinamizadora de procesos de transformación social desde la biblioteca pública". *Revista Interamericana de Bibliotecología* 35 (1) (2012): 73-82. Fecha de consulta: 17 de noviembre de 2014, http://www.redalyc.org/articulo.oa?id=
179024991007

"La biblioteca pública, un lugar para la formación ciudadana: referentes metodológicos para el proceso de investigación". *Revista Interamericana de Bibliotecología* 33 (2) (julio/diciembre 2010): 287-313. Fecha de consulta: 7 de julio de 2014, http://aprendeenlinea.udea.edu.co/revistas/index.php/RIB/article view/7644/7069

Jaramillo, Orlanda, Didier Álvarez Zapata y Daniel Moncada P. "Políticas públicas para bibliotecas públicas: una propuesta de soluciones locales a problemas globales". *Investigación Bibliotecológica* 19 (39) (julio/diciembre 2005): 13-27. Fecha de consulta: 7 de julio de 2014, http://www.scielo.org.mx/scielo.php?pid=S0187-358
X2005000200002&script=sci_arttext

Ley Nº18.567. Descentralización política y participación ciudadana. Fecha de consulta: 25 de junio de 2014, http://www.parlamento.gub.uy/leyes/AccesoTextoLeyasp?-Ley=18567&Anchor=

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.002

Meneses Tello, Felipe. "Bibliotecas y sociedad: el paradigma social de la biblioteca pública". *Investigación Bibliotecológica* 27 (61) (septiembre/diciembre 2013): 157-173. Fecha de consulta: 21 de junio de 2014, http://www.revistas.unam.mx/index.php/ibi/article/download/42818/38893

Municipio F. *Plan Municipal de Desarrollo,* 2010. Fecha de consulta: 21 de junio de 2014, http://municipiof.montevideo.gub.uy/system/files/pmd.pdf

Núñez Ansuas, Jimena. "Servicios de información en la Zona 9 y las políticas de información en salud destinadas al público joven", en *Estrategias de información y comunicación en salud centradas en adolescentes,* M. Sabelli y J. Rasner (comp.), Montevideo: PRODIC (en prensa), 2013.

Revesz, Bruno. "Políticas de información, bibliotecas públicas y desarrollo local y regional". *Revista Interamericana de Bibliotecología* 24 (2) (julio/diciembre 2001): 45-63. Fecha de consulta: 7 de julio de 2014, http://aprendeenlinea.udea.edu.co/revistas/index.php/RIB/article/viewFile/3198/2963

Ríos Ortega, Jaime. "El acceso abierto a la información y la formación ciudadana", en *Regulaciones que impactan la infodiversidad y el acceso abierto a la información en la sociedad global y multicultural*, Estela Morales Campos (comp.), 135-148. México: IIBI, 2013. Fecha de consulta: 21 de junio de 2014, http://132.248.242.6/~publica/conmutarl.php?arch=4&idx=1157

Sabelli, Martha. "Investigaciones sobre el comportamiento informativo de adolescentes y jóvenes en situación vulnerable: hacia una información inclusiva en Uruguay", en *Usuarios de la información en diferentes comunidades académicas y sociales: investigaciones,* Juan José Calva González (comp.), 77-104. México: IIBI, 2013. Fecha de consulta: 4 de julio de 2014, http://132.248.242.6/~publica/conmutarl.php?arch=4&idx=1089

y Jorge Rasner. *Informe final. Las estrategias de información y comunicación centradas en los jóvenes y adolescentes en el ámbito de la salud: análisis y propuestas (RAP-ASSE, Zona 9 de Montevideo),* Montevideo: Prodic, 2012.

y Verónica Rodríguez Lopater (comp.). *La información y las jóvenes en contextos desfavorables: construyendo puentes para la inclusión social desde la investigación,* Montevideo: CSIC, 2012.

Sabelli, Martha. *La información y el ciudadano en el entorno de la Sociedad de la Información: percepción de los actores políticos y sociales en el Uruguay,* Montevideo: Ediciones de la Banda Oriental, 2008.

Sung, Hui-Yun, Mark Hepworth y Gillian Ragsdell. "Investigating essential elements of community engagement in public libraries: an exploratory qualitative study", *Journal of Librarianship and Information Science* 45 (3) (2013): 206-218. Fecha de consulta: 19 de noviembre de 2014, http://lis.sagepub.com/content/45/3/206

Szafran Maiche, Paulina. "Recursos de información para la ciudadanía: documentos, servicios de información y comunicación", en *La información y las jóvenes en contextos desfavorables: construyendo puentes para la inclusión social desde la investigación,* Martha Sabelli y Verónica Rodríguez Lopater (comp.), 161-178. Montevideo: CSIC, 2012.

Veneziano Esperón, Alicia. *La participación en el diseño e implementación de políticas públicas en la descentralización del gobierno municipal de Montevideo (1990-2000),* trabajo presentado al V Congreso del CLAD, 2000. Fecha de consulta: 20

de junio de 2014, http://siare.clad.org/fulltext/0039229.pdf
Sustentabilidad política, reforma de Estado y participación ciudadana en la Intendencia Municipal de Montevideo, trabajo presentado en el V Congreso Nacional de Ciencia Política-Sociedad Argentina de Análisis Político, 2001. Fecha de consulta: 20 de junio de 2014, http://www.saap.org.ar/esp/docs-congresos/congresos-saap/V/docs/diaz/alicia-veneziano.pdf
"Izquierda y descentralización en Montevideo", *Ecuador Debate* 61 (2004). Fecha de consulta: 10 de junio de 2014, www.platafor mademocratica.org/Publicacoes/5303.pdf"
Gobernanza en la descentralización: una mirada desde América Latina, trabajo presentado en VII Congreso Español de Ciencia Política y de la Administración: Democracia y Buen Gobierno, 2005. Fecha de consulta: 20 de junio de 2014. http://www.aecpa.es/uploads/files/congresos/congreso_07/area03/GT10/VENEZIANO-Alicia.pdf
"La participación ciudadana en la descentralización de Montevideo: aprendizajes y reflexiones desde los noventa", *Revista Uruguaya de Ciencia Política* 17 (1) (2008): 203-227. Fecha de consulta: 20 de junio de 2014, http://www.scielo.edu.uy/scielo.php?script=sci_pdf&pid=S0797-97892008000100009&lng=es&rm=iso&tlng=es
Relaciones intergubernamentales, intragubernamentales y socio-gubernamentales en el decreto de descentralización de Montevideo, trabajo presentado en X Jornadas de Investigación de la Facultad de Ciencias Sociales, 2011. Fecha de consulta: 20 de junio de 2014, http://www.fcs.edu.uy/archivos/Veneziano.pdf

Para citar este artículo:
Szafran, Paulina. 2016. "Información, comunicación y cultura en la gestión local: la experiencia municipal en un territorio de vulnerabilidad de la ciudad de Montevideo." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 19-38. http://dx.doi.org/10.1016/j.ibbai.2016.10.002

Institutional genetic stamp and development of international identity: bibliometric study of spinal cord research and protocols using cats en Cinvestav

Francisco Collazo-Reyes
María Elena Luna-Morales
Evelia Luna-Morales*

Received:
Jane 13, 2014.
Accepted:
December 2 , 2015.

Abstract

A corpus of literature addressing the neurophysiology of the spinal cord and the cat as an experimental model are examined. An early research practice as product of genetic institutional imprinting. The objective is to analyze the body of literature as a scientific communication event, showing how each peer reviewed paper contributes to developing a sense of international identity in the Department of Physiology and Cinvestav. The formation of relationships and structures of scientific communication through quinquennial socio-technical networks and the weight of institutional contribution to the global literature on the subject are analyzed. The thematic association of the spinal

* Los tres autores pertenecen al Cinvestav, México. (fcollazo@fls.cinvestav.mx); (meluna@cinvestav.mx); (eluna@cinvestav.mx)

cord, the cat as experimental model and P. Rudomín, as the most productive author, have remained stable in indexes for over 50 years. During this period, the association has developed patterns of institutional affiliation with regard to international systems of scientific communication, giving rise to the development of one of the most symbolic lines of research in genetic imprinting in the Cinvestav.

Keywords: Bibliometric study; Bibliometric indicators; Spinal-Cord; Experimental models; Cat; Cinvestav-Department of Physiology; Pablo Rudomín; Sociotechnical-Networks.

Resumen

Se estudió la literatura generada en aspectos neurofisiológicos de la médula espinal y el gato como modelo experimental. Una práctica de investigación temprana como producto de la impronta genética institucional. El objetivo es analizar el cuerpo de literatura como un evento de comunicación científica, para mostrar cómo cada publicación arbitrada aporta al desarrollo de un sentido de identidad internacional del trabajo del Departamento de Fisiología y del Cinvestav. Se analizó la conformación de relaciones y estructuras de comunicación científica a través de redes sociotécnicas quinquenales así como el peso de la aportación institucional a la literatura global en el tema. La asociación del tema de la médula espinal, el gato como modelo experimental y P. Rudomín como autor más productivo se han mantenido vigentes en la literatura científica del tema por más de 50 años. Durante este periodo, esta asociación ha desarrollado patrones de afiliación institucional al sistema de comunicación científica internacional, dando lugar al desarrollo de una de las líneas de investigación más simbólicas de la impronta genética en el Cinvestav.

Palabras clave: Estudio bibliométrico; Indicadores bibliométricos; Médula espinal; Modelos experimentales; Gato; Cinvestav-Departamento de Fisiología; Pablo Rudomín; Redes-Sociotécnicas.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

Introduction

The founding of the Advanced Studies Center of IPM (Cinvestav, by its Spanish-language acronym) carries the early spirit of the genetic stamp of post-war science.[1] An institutional model conceived to act in a given period as a transition from small to big science[2] which arose to face a twin challenge entailing the construction of modern scientific practices that involve, on one hand, finding solutions to local problems and, on the other, generating results that contribute to the body of universal knowledge.[3] The principles and values needed to face these challenges reside in the institutional genetic stamp,[4] expressed in the official decree of founding in 1961[5], and in the patterns of scientific communication contained in an early journal article by A. Rosenblueth, J. Alanis and G. Pilar that marks the date Cinvestav first entered in international bibliographic indexes, in fact, in the same year of its founding.

On one hand, the explicit values expressed in the founding decree include rigorous criteria for hiring researchers, requiring candidates to hold a PhD, work full-time and undergo ongoing evaluation. Cinvestav researchers were not offered tenure, though academic and research freedom were guaranteed. Candidates, moreover, were expected to participate in scientific collaboration project and the training of new researchers. This foundational document also provided for an institutional administration based on very simple standards.[6] On the other hand, the first journal publication[7] establishes six international publication standards: 1) dissemination in international peer-reviewed journals; 2) international collaboration; 3) contents presented in compliance with IMRD scientific format (introduction, materials, results and discussion);[8] 4) use of citations from accredited sources; 5) international visibility through use of citation, and 6) papers written in English. These criteria correspond to the emergence of the international modes

1 M. Albornoz, "La política científica y tecnológica en América Latina frente al desafío del pensamiento únic
2 D. J. de Solla Price, Little Science, big Science, y Little Science, big Science…and Beyond.
3 Manual de Santiago, Manual de Santiago de internacionalización de la ciencia y la tecnología
4 M. Ibarrola, "La impronta genética del Cinvestav. Una mirada a la excelencia de la institución entonces y ahora"; B. R. Clark, The Higher Education System: Academic Organization in Cross- National Perspective.
5 Diario Oficial de la Federación, Decreto de la creación del CIEA, 5 noviembre de 1960.
6 M. Ibarrola, "La impronta genética…".
7 A. Rosenblueth, J. Alanis y G. Pilar, "The Accessory Motor Innervation of the Diaphragm".
8 L. B. Sollaci y M. G. Pereira, "The introduction, methods, results, and discussion (IMRAD) structure: a fifty-year survey".

of production and certification of knowledge in the post-war period.[9] The totality social and scientific relations are oriented toward providing the institutional context for scientific development, the formation of resources and the continuity of results. These features have provided Cinvestav a differentiated identity for practicing science in Latin America and the Caribbean.[10] The details of its development lie in diverse efforts aimed at constituting research teams and lines of research with the international scientific community. These lines of research stand out for having maintained stability in the generation of scientific products. These lines of research are like spinal medulla, which have been strengthened by affiliation to international scientific practices and standards. Generally, these processes are still in the stage of development of local capacities for accrediting results in the international system of knowledge by way submitting their results to a peer review system. The conception and materialization of Cinvestav coincided with other key events: a) the creation of citation indexes by the Institute for Scientific Information (ISI), which set the stage for the emergence of highly influential mainline journals supporting the mechanisms for certifying science; b) increased use of large vertebrate animals as research models, which exerted an influence in the exponential growth of literature in diverse fields, including spinal cord research.[11] The use cats in neurophysiological spinal cord research researched its zenith in indexed scientific output in the first decades of the second half of the twentieth century. Diverse experimental techniques were developed in cats before being used in smaller animals.[12] A search of Scopus of the terms afferent, muscle, depolarization in conjunction with spinal-cord and cat reveals an annual output that is clearly exponential in form over the period 1960 to 1980. This period is followed by a long period of decline until 2013, in which the interest in using cats in experimental model waned in view of rising social resistance to using large animals, the associated costs of their maintenance and the imposition of more stringent bio-ethical standards.

The study of these topics has been approached by and large through historiographical methods, including those that employ scientific literature as a unit of analysis. The most frequently used is developed on the basis of genealogical

9 R. Florida y M. Kenney, "Institutions and Economic Transformation. The Case of Postwar Japanese Capitalism".
10 H. Vessuri, "El Centro de Investigación y de Estudios Avanzados del IPN (Cinvestav)".
11 B. Rexed, "The Cytoarchitectonic Organization of the Spinal Cord in the Cat"; P. A. Guertin, "The Spinal Cord: Functional Organization, Diseases, and Dysfunctions".
12 A. Frigon, A. "The Cat Model of Spinal Cord Injury"; D. P. Cardinali, Neurociencia aplicada: Sus fundamentos.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

algorithms and profiles of the development of a fields.[13] Other approaches examine diverse indicators in order to analyze the development of fields through the identification of changes in the modes of knowledge and scientific practices in each field.[14] In accord with another methods, such as the "network actor",[15] the developmental dynamics of scientific fields is the product of many interactions and elements explained only by social and technical factors.[16]

This work uses scientific papers as a unit of analysis, based on the concept of referential intertextuality as a naturally occurring feature of scientific literature,[17] which helps us weigh the operational influence of the texts.[18] Pursuant to this idea, each new publication contributes elements to the construction of relational networks activated through references, citation and co-authorship. The continuity of the publication of results creates the web of relations and communication flows tat orient sense of institutional scientific affiliation. In accord with the type of journal, these flows be involved with scientific discourses contained in local, regional or international sources (or any combination of these). In this way, scientific communities build their lines of research, objects of study and discourses insofar as they achieve stable conditions for maintaining the continuity of publication.[19] Seen in this way, texts are understood as knowledge that is socially constructed.

It is assumed that a line of research on spinal cord using cats for experimentation is signified by marks contained in the texts (lead a uthors, most frequently used terms, preferred journals and the model) as a symbolic topic in Cinvestav's Department of Physiology. The developmental scenario of this symbolic sense is the formation of international scientific communication developed in the institution for over fifty years.

13 E. Garfield, A. I. Pudovkin y V. S. Istomin, "Why Do We Algorithmic Historiography"; L. Leydesdorff, "Eugene Garfield and Algorithms Historiography: Co-Words, Co-Authors and Journals".

14 J. V. Pickstone, "Working knowledge before and after circa 1800: Practices and disciplines in the history of science, technology and medicine"; J. V. Pickstone, "A Brief Introduction to Ways of Knowing and Ways of Working. History of Science".

15 M. Callon y B. Latour, "Unscrewing the big leviathan: How actors macrostructure reality and how sociologists help them to do so"; B. Latour, "On actor-network theory - A few clarifications".

16 J. Law, "Notes on the theory of the actor network-ordering, strategy, and heterogeneity".

17 A. J. Devitt, "Intertextuality in Tax Accounting; Generic, Referential and Functional".

18 S. Doheny-Farina, "Creating a text / Creating a Company. The role of a text in the Rise and Decline of a New Organization".

19 Ch. Bazerman, Shaping Writing Knowledge; Ch. Bazerman y J. Paradis, Textual Dynamics of the Professions. Historical and Contemporary Studies of Writing in Professional Communities; C. Berkenkotter, T. N. Huckin y J. Ackerman, "Social Context and Social Constructed Text".

In this paper, we use a methodology based on three complementary features: 1) an analytical matrix that combines diverse bibliographical elements (authors, references, citations, co-authorship, frequently used terms and experimental models); 2) analysis of these elements organized in eleven quinquennial socio-technical networks; 3) the study of international scientific output in order to determine the positions held by authors, Cinvestav and Mexico in the spinal cord and cat topic area in Scopus. This indicator of the contribution of Cinvestav and the Department of Physiology to the body of knowledge in this field is, according to Manual de Santiago,[20] and indicator of the degree of internationalization of the institution.

We find that the study of neurophysiological features of the spinal cord, the use of cats in the experimental model, Cinvestav, the Department of Physiology and P. Rudomín emerged in the scientific literature at the same time and they have continued to be visible for period of more than fifty years (1961-2013). Over this period, the association of the topic area, the experimental model, the authors and the institution have continued to appear in bibliographical indexes and international indicators of scientific output. This association has built a line of research on the international stage and, at the local level, a symbolic libe of research that has built the international identity of the Department of Physiology of the Cinvestav.

Methodology

On the basis of a previous paper on the output of the Department of Physiology, [21] we identified the first group of researchers consisting of A. Rosenblueth, J. García Ramos and P. Rudomín that was able to maintain continuity of output and who established a line of research that has remained active over the entire life of the Cinvestav. The Atlas de la Ciencia Mexicana, 1961-2013 (The Mexican Science Atlas, 1961-2013) was used as the basis of information (http://atlasdelacienciamexicana.org/).[22] We have included papers lf the aforementioned authors who used cats in the experimental design to study the neurophysiological aspects of the spinal cord.

20 Manual de Santiago, Manual de Santiago…, 111.
21 F. Collazo-Reyes, M. E. Luna-Morales y E. Luna-Morales, "Aproximación a las formas de organización de la producción científica a través de redes de coautoría".
22 Atlas de la Ciencia Mexicana 2012: Bilingual edition.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

We identified 132 papers. From this body of work we generated two files: the first includes references made by them and the second references received. Upon this basis, a local data base was developed with three relational tables: 1) published papers, 2) references included, and 3) references received.

Development of socio-technical networks by five-year intervals

On the basis of the organization of information resources, a historical analysis of the literature was performed. In this case, scientific output was divided into five-year blocks and the methodology employed was the analysis of socio-technical networks. Consequently, eleven networks were developed that include the following components: 1) co-authorship relationships of the paper published in the topic area; 2) journals; 3) the number of references included in the papers; 4) the number of citations received; 5) most frequently used terms in titles of papers; and 6) experimental models. The networks are depicted using the following symbols: the author nodes are represented by a square; the journals by a diamond; the number of references by a triangle; the number of citations by a red circle; the key words by a pink circle and the experimental model by a hexagon. All of the components of a single paper are connected by lines, as are all of the authors or words that concur in the papers published in each five-year interval. In each period, we analyzed the structure of the co-authorship relationships; the preferred journals for publications for citing and being cited; the average number of references and citations per work; the frequency of the use of terms, and the experimental models used. We also analyzed the co-occurrence of words in two or more papers. This approach allowed us to describe the patterns of communication associated with the continuity of output in the spinal cord-cat line of research in Cinvestav. Pajek software (http://vlado.fmf.uni-lj.si/pub/networks/pajek/doc/pajekman.pdf)[23] was used to develop the matrices and the networks. This program is useful for analyzing large networks.

2.2 Contribution of the institution to international science.

The internationalization of the work of a research institute is expressed

23 V. Batagel y A. Mrvar, Pajek. Program for Analysis and Visualization of Large Networks: Reference Manual. List of commands with short explanation version 2.05.

in multiple ways, one of which is the output of scientific papers published in peer reviewed journals.[24] In this case, the weight of the position of the author or institution was used, assigned as a function of scientific output in the international classification obtained through the Scopus information system. In this way, we determined the position of P. Rudomín and Cinvestav within the international scientific literature. In this case, we used information searches in the Scopus system of the most meaningful words in titles as topics of information, combined with the topic spinal cord and cat in the experimental under four distinct search strategies: 1) Afferent + spinal-cord and cat; 2) Muscle + spinal cord and cat; 3) Presynaptic and cat, y 4) Depolarization + spinal-cord and cat, all within the period of 1960-2013. For these three searches, the global data were refined by country, institution and author. The Scopus system organizes information in accord with the output of the forty most productive authors o institutions. The information on the names of institutions where authors work was normalized, and on the basis of output the position of Cinvestav and the authors was determined.

Results

General findings

A set of 132 papers were found that address the line of spinal cord-cat research in Cinvestav, consisting of the establishment of multiple relationships of collaboration, referential intertextuality and citation involving authors, journals and keywords in the dominant discourse in the scientific literature of the main current associated with the topic at hand. This web involves thousands of influence and acknowledgement relationships established in 4,298 references made and 3,458 citations received. It includes forty-four preferred journals for publication, 444 cited in references and 360 that contain cited works. Hundreds of authors are involved in the references and citations. These relationships of scientific communication have maintained the visibility of Cinvestav in bibliographic indexes of mainline scientific literature over the last fifty years.

24 Manual de Santiago, *Manual de Santiago*…

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

Five-year networks

The spinal cord-cat line of research has its background in the practical research performed by the National Cardiology Institute. It began with the research group put together by the internationally renowned researcher A. Rosenblueth. The main networks show the formation of scientific communication structures that characterize international accreditation practices that came after the first research done in Cinvestav. The five-year period of 1961-1965 (*Figure 1*) shows the pioneer research team in the topic area. It includes the first institutional international bibliometric indicators: 11 papers, written by nine authors, principally: P. Rudomín, A. Rosenblueth and J. García Ramos; in four journals (one regional journal and three international journals); with 179 references that correspond to papers published mainl,y in the following journals: Journal of Neurophysiology, Brain Research, Brain Research Bulletin, Archives Italiennes de Biologie, and Journal of Physiology; 117 citations received to date, appearing largely in Archives Italiennes de Biologie, Brain Research, Electro Encephalography and Clinical Neurophysiology, Acta Physiologica Latinoamericana, and Experimental Brain Research; using a discourse featuring six terms: afferent, arterial, blood, control, motor and pressure; with the cat as the experimental model.

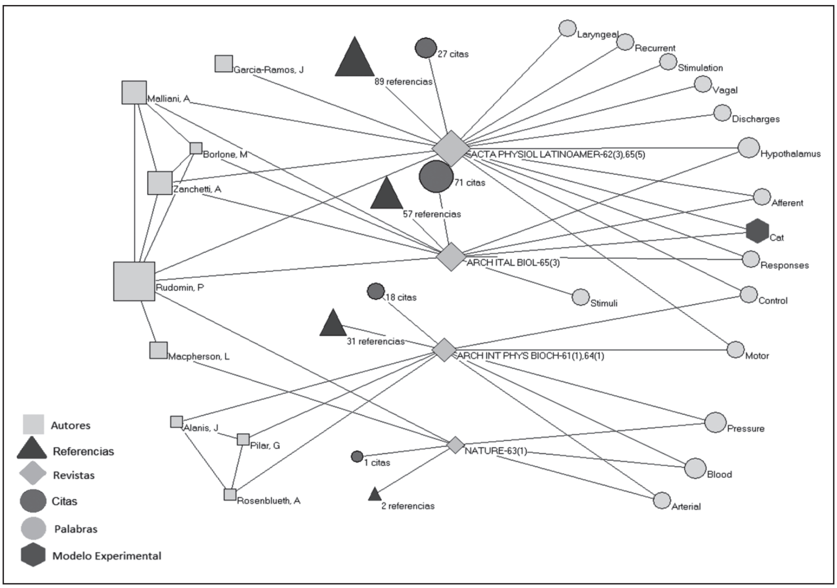


Figura 1. Five-year socio-technical network: 1961-1965

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 39-58

The five-year periods of 1966-1970, 1971-1975 and 1976-1980 reveal patterns of scientific communications that have the features of the first five-year period. The number of papers grew to 69 and citations moved to over 1,000; a co-authorship of 55 researchers, 15 journals and more than 1,000 references. The scientific discourse is centered on the terms afferent, depolarization, spinal, cord and cat.

The first four networks (1961-1980) share several features. They publish mainly in the regional journal Acta Physiologica Latinoamericana; the most productive and consistent authors are P. Rudomín and J. García Ramos; the most cited papers cited are published in Brain Research and the most important citing journals are Physiological Reviews, Journal of Neurophysiology and Brain Research. The continuity of publication in the line of research maintained the visibility of Cinvestav's Department of Physiology in the Science Citation Index during the decades of the 60s and 70s.

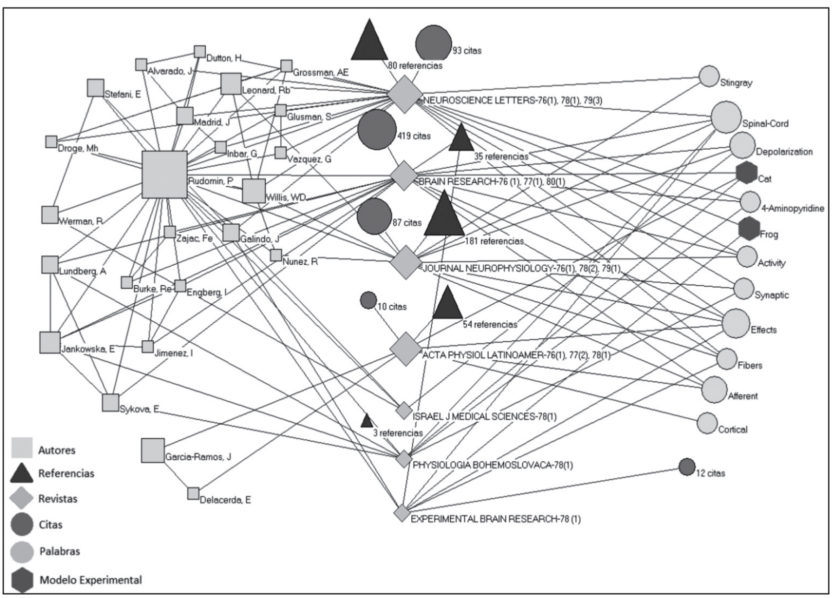


Figura 2. Five-year socio/technical network: 1976-1980

In the period after the third network (1971-1975) the co-authors S. Glusmann, R. Nuñez and J. Madrid emerge as leading researchers of the generation of students formed in Cinvestav by P. Rudomín. The network of

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

1976-1980 (*Figure 2*) exhibits the most productive period associated with greater diversification of the nationality of the authors. More traditional local authors coincide: P. Rudomín y J. García-Ramos, as do young researchers trained in Cinvestav (R. Nuñez, J. Madrid, S. Glusman, I. Jiménez, J. Galindo); moreover, authors assigned in other departments (H. Dutton) and authors from recognized foreign institutions (F.E. Zajac) and mainly new coauthors (R. Leonard, R. Werman, W.D. Willis, A. Lundberg, T. Jankowska, among others). Fully 79 % of the output is attributable to P. Rudomín, who consolidated as the main builder of the line of research. In this period, the frog as experimental model appears for the first time.

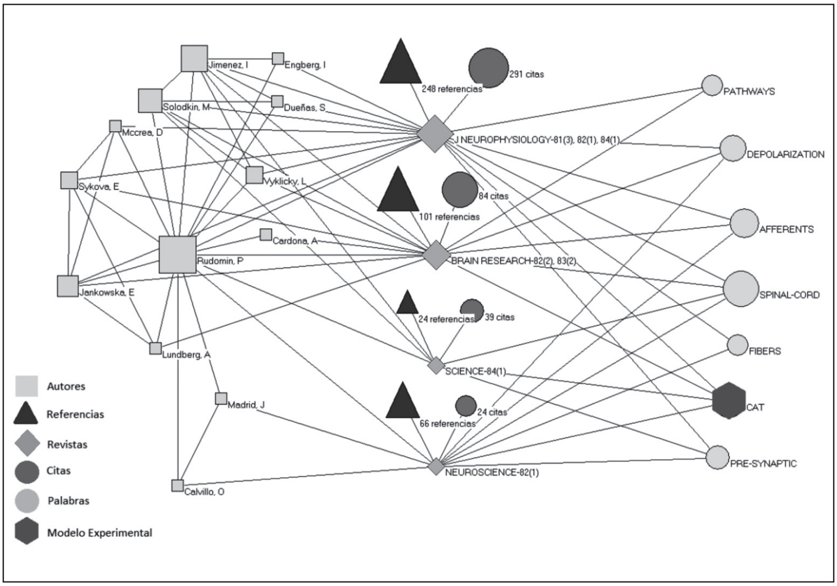


Figura 3. Five-year socio/technical network: 1981-1985

The patterns of communication of the networks in the decade of the 80s exhibit changes in communications patterns (*Figure 3*). The journal Acta Physiologica Latinoamericana, one of the more productive journals of the first two decades, no longer appears, nor does its most productive author J. García Ramos. The output is based largely on researchers working in Cinvestav. The terms spinal, cord, afferent, cat, depolarization, fibers, among other, comprise the matrix of most frequently used words identifying the literature of this group of researchers in these topics at the international level. The authors P. Rudomín, I. Jiménez and M. Solodkin stand out as the most productive collaborative relationship. It includes the most frequently cited

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 39-58

papers which reached average citation and references per paper twice as high as those reached by authors in previous five-year intervals.

According to *Figure 4*, in the first half of the 90s, with the same base of authors formed in Cinvestav, production and journals grew, but one of the lowest citation averages was obtained. Some of the words in the traditional matrix changes to include such words ad stimulation, muscle, synaptic y presynaptic; while others such as afferent, inhibition depolarization remained unchanged.

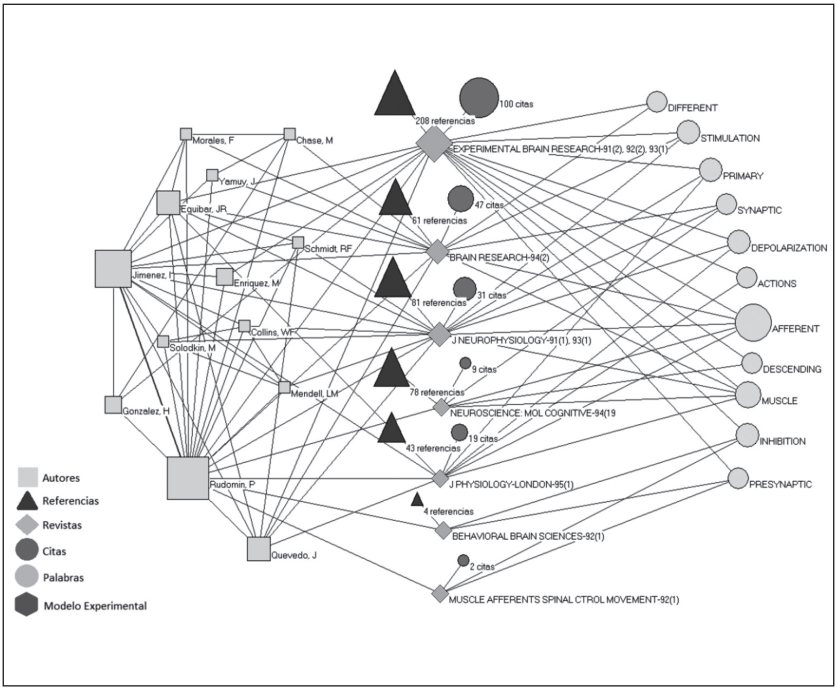


Figura 4. Five-year socio/technical network: 1991-1995

As can be observed in *Figures 5 and 6*, with the production periods of 1996-2000 and 2001-2005, the traditional term matrix that includes the words afferent, spinal, cord and cat are taken up again, including the same patterns of communications of previous five-year intervals. The most frequently cited papers are published in Experimental Brain Research and are authored by researchers trained in Cinvestav. These networks have the same nuclei of lead authors, journals and average number of references. In the period 2001-2005 the historical average of citations per work declined with respect to the previous five-year period.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

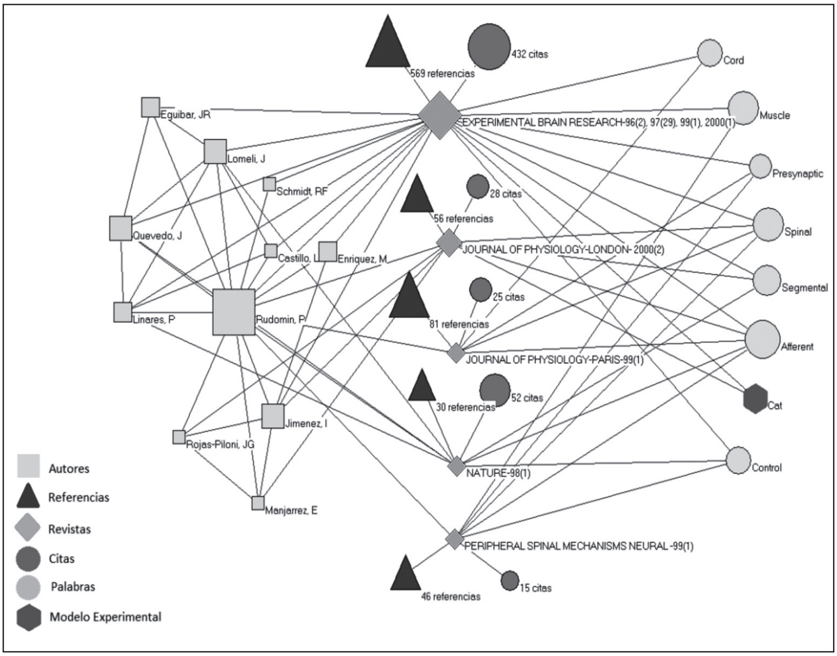


Figura 5. Five-year socio/technical network: 1996-2000

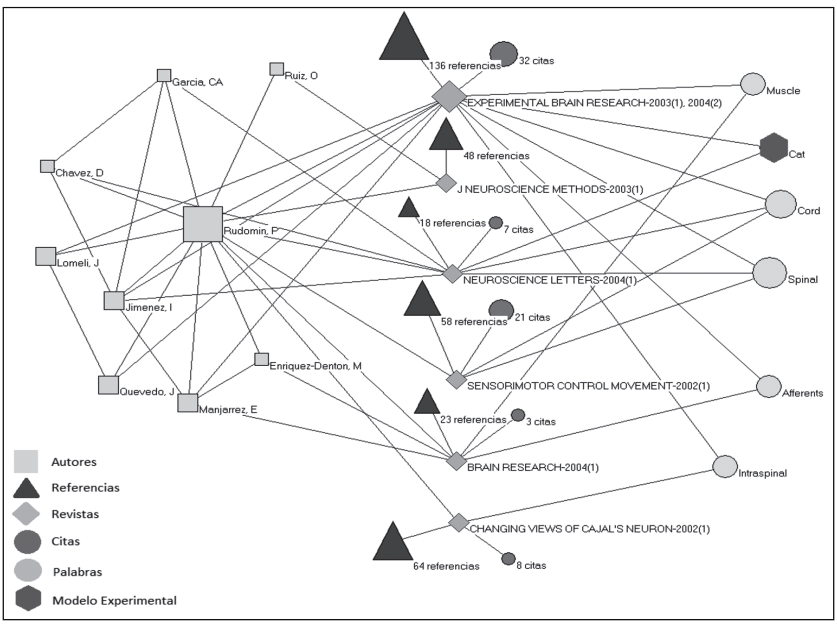


Figura 6. Five-year socio/technical network: 2001-2005

The five-year period 2006-2010 exhibits distinct communication patterns in terms of production (*Figure 7*). Four papers, three co-authors, one journal (Experimental Brain Research) and three main words: afferent, joint and cat.

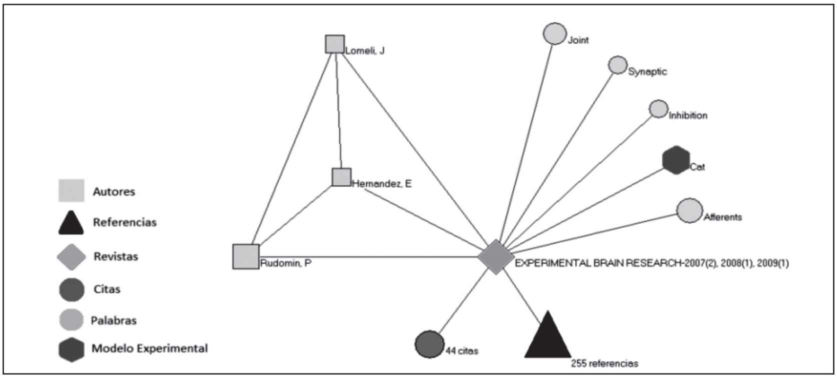


Figura 7. Five-year socio/technical network: 2006-2010

Figure 8 shows the last network (2011-2013) with the lead authors (P. Rudomín and I. Jiménez), the traditional words of the research group and one of the preferred journals, Journal Physiology. New names of authors and journals also appear with aspects of engineering and computers, among these an open access journal. The features of *Figures 7 and 8* are interpreted as signs of a change in the traditional patterns of communication.

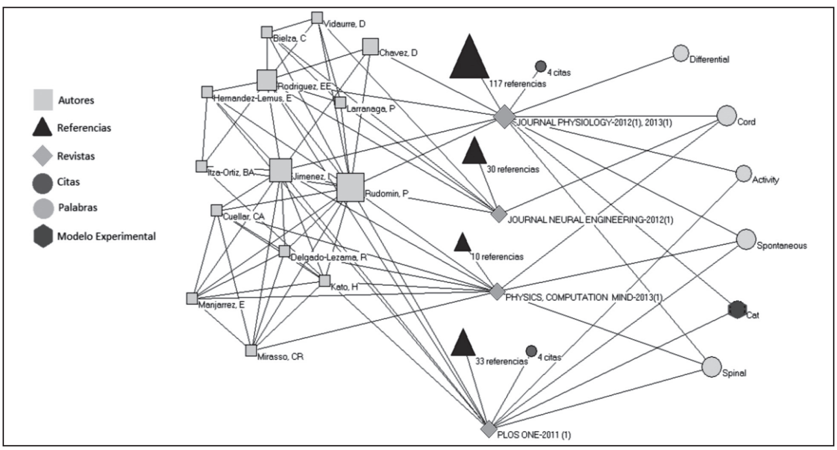


Figura 78 Five-year socio/technical network: 2011-2013

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

The socio-technical of authors, journals, citation, references and words show step by step the production events building the sense of an international identity of Cinvestav. The networks offer information on the aspects that have to do with diverse dimensions of the internationalization of the institutional work. In the first place, is the fact that using the most prestigious journals in the field (Journal of Neurophysiology, Experimental Brain Research, Journal of Physiology-London and Brain Research). These four titles are among the five first places of journals in accord with the three functions they carry out in the communication system: 1) as sources of publication; 2) as sources cited; and 3) and as citing sources. >In the second place, in the publication of co-authored works, 37 researchers from foreign institutions participated. In the third place, a high average of 26 citations per work was identified. In the fourth place, the journals used for publication are included in the international bibliographical indexes as mainline journals.

Institutional contribution to international scientific production

The scientific production, as an expression of institutional internationalization, is measured by looking at the positions of authors and institutions in a classification of the international production in the field obtained from Scopus. In accord with Table 1, the institutional scientific production generated in the time has positioned the authors internationally, represented by P. Rudomín, and Cinvestav among the 10 first places of 40 in the three topic areas analyzed. In the most representative topic area, Afferent + Spinal Cord + Cat, theyu occupied second and fourth place, respectively. These positions in the international level have a specific weight: they are indicative of an important degree of contribution to the international body of knowledge in the three topic areas.

Tabla 1. Indicadores de internacionalización de la producción científica sobre médula-espinal-gato, 1960-2013

Number	Search strategy		Production	Positions in international scientific literature (Scopus) [1]		
	Words	Model	Words	Author		Cinvestav[2]
1	Afferent + spinal cord	Cat	2,867	P. Rudomín	2	4
2	Muscle + spinal cord	Cat	2,864	P. Rudomín	6	10
3	Depolarization + spinal cord	Cat	488	P. Rudomín	1	1

Source: Scopus, 1960-2013.

1 Scopus, includes the top 40 most productive places in terms of scientific output.

2 Scientific production registered in Scopus.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 39-58

Discussion

The creation of the Cinvestav, the beginning of the citation indexes, the increase of scientific output in the area of spinal cord and the use of the cat as an experiemental model, as well as the adscription of a group of neurophysiology researchers to Cinvestav (A. Rosenblueth, J. García-Ramos and P. Rudomín)[25] are events that coincided in the early 1969s in science in Mexico. This relationship has remained unchanged in the international bibliographic indexes up until 2013, a period of over fifty years. During this period, the matrix of terms of afferent, cord and spinal; the cat as experimental model and the author P. Rudomín have signified in the indicators of the scientific output in the field. Cinvestav and the Department of Physiology-Mexico have attained a position on the map of international scientific geography as an important node of flow, attraction and production of knowledge in the area.

The five-year socio-technical networks reveal the process of institutional rooting in this research practice. It is characterized by creation of stable institutional conditions to support the production of knowledge in neurophysiological topics on spinal cord over the history of the institution. In the scenario of scientific communication, this body of literature is comprised of diverse elements: authors, journals, citations, references, experimental models and words. What can be seen in the five-year networks is that every time a new communication unit published this influences in the structures of the conformation of the networks: nodes and relationships appear and disappear in the networks. The components that repeat increase the value of the nodes and create a distinction. New relationships are established, while other that already exist consolidate and structures that are differentiated by the density of the relationships between the components of the network are developed. In this way, each five-year network, in its context, represents a production event in the sense of the international identity of the line of research.

Each new peer-reviewed journal, as an expression of the institutional genetic imprint, contributes elements to the construction of the sense of institutional affiliation to the dominant international discourse. According to Bourdieu,[26] the construction of this sense constitutes a symbolic institutional capital in the scientific-academic landscape. This capital, insofar that it is accredited in journals included in bibliographic indexes, can be interpreted

25 F. Collazo-Reyes, M. E. Luna-Morales y E. Luna-Morales, "Aproximación a las formas…", 1-9.
26 P. Bourdieu, *The scientific calling: science of science and reflexivity*.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

as an indicator of the scientific visibility in the international scientific communication system. Likewise, the components of the publications (authors, journals, words and model), insofar as they repeat, establish relationships and distinguish and accumulate certified symbolic capital in international bibliographic indexes. According to the results, in the topic area of spinal cord the most frequently repeated components that distinguish and accumulate capital are P. Rudomín, as author; afferent, spinal, cord, cat, depolarization, and muscle, as words; and cat, as experimental model; Journal of Neurophysiology, Experimental Brain Research, Journal of Physiology-London and Brain Research, as the preferred sources for publication, and as the most citing and citing.

Conclusions

Every time a the international scientific communication system certifies an article with the marks P. Rudomín, spinal-cord-cat and Cinvestav-Department of Physiology, there is an expression of the genetic imprint of Cinvestav in the context of mainline scientific discourse in the topic area of spinal cord.

The structures of the communication relationships resulting from authors, words, journals, references and citations allowed for the showing of the scientific-academic capital of Cinvestav as an indicator of the scientific visibility constructed in the international bibliographic indexes.

The terms Rudomín, spinal-cord-cat and Cinvestav have signified, in terms of key word of access to sceintific literature, as elements of a single information search matrix or equation. They constitute the most symbolic code of Cinvestav that has maintained the visibility of this institution during its whole history in international indexes.

Acknowledgements:

to Dr. Ricardo Félix Grijalva for his valuable comments on the contents of this paper.

To CONACYT-Red **Complexity**, Sciences and **Society**.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 39-58

References

Albornoz, M. "La política científica y tecnológica en América Latina frente al desafío del pensamiento único". *Redes* 4 (10) (1997): 95-115.

Atlas de la Ciencia Mexicana 2012: Bilingual edition. México: AMC, 2 vols., 2012. Fecha de consulta: 26 de noviembre de 2014, http://atlasdelacienciamexicana.org/

Batagel, V. y A. Mrvar. *Pajek. Program for Analysis and Visualization of Large Networks: Reference Manual. List of commandswith short explanation version 2.05*, 2011. Fecha de consulta: 26 de noviembre de 2014, http://vlado.fmf.uni-lj.si/pub/networks/pajek/doc/pajekman.pdf

Bazerman, C. y J. Paradis. *Textual Dynamics of the Professions. Historical and Contemporary Studies of Writing in Professional Communities.* Wisconsin; University of Wisconsin Press, 1991.

Bazerman, C. *Shaping Writing Knowledge.* Wisconsin: University of Wisconsin Press, 1988.

Berkenkotter, C., T. N. Huckin y J. Ackerman, "Social Context and Social Constructed Text", en *Textual Dynamics of the Professions,* Charles Bazerman y James Paradis (eds.), 191-233. Wisconsin: University of Wisconsin Press, 1991.

Bourdieu, P. *El oficio del científico: ciencia de la ciencia y reflexividad.* Barcelona: Anagrama, 2003.

Callon, M. y B. Latour. "Unscrewing the big leviathan: How actors macrostructure reality and how sociologists help them to do so", en *Advances in Social Theory and Methodology*, K. D. Knorr-Cetina y A. V. Cicourel (eds.), 277-303. 1981. Boston, MA: Routledge & Kegan Paul, 1981.

Cardinali, D. P. *Neurociencia aplicada: sus fundamentos.* Buenos Aires: Editorial Médica Panamericana, 2007.

Clark, B. R. *The Higher Education System: Academic Organization in Cross-National Perspective.* Berkeley: University of California Press, 1983.

Collazo-Reyes, F., M. E. Luna-Morales y E. Luna-Morales. "Aproximación a las formas de organización de la producción científica a través de redes de coautoría". *Avance y Perspectiva* 4 (3) (2012): 1-9. Fecha de consulta: 26 de noviembre de 2014, http://avanceypers
pectiva.cinvestav.mx/1866/aproximacion-a-las-formas-de-organiza
cion-de-la-produccion-cientifica-a-traves-de-redes-de-coautoria

De Solla Price, D. J. *Little Science, Big Science… and Beyond.* Columbia: Columbia University Press, 1986.

Little Science, Big Science. Columbia: Columbia University Press, 1963.

Devitt, A. J. "Intertextuality in Tax Accounting; Generic, Referential and Functional", en *Textual Dynamics of the Professions,* Charles Bazerman y James Paradis (eds.), 336-355. Wisconsin: University of Wisconsin Press, 1991.

Diario Oficial de la Federación. *Decreto de la creación del CIEA*, 5 noviembre de 1960.

Doheny-Farina, S. "Creating a text / creating a Company. The role of a text in the Rise and Decline of a New Organization", en *Textual Dynamics of the Professions,* Charles Bazerman y James Paradis (eds.), 306-335. Wisconsin: University of Wisconsin Press, 1991.

Florida, R. y M. Kenney. "Institutions and Economic Transformation. The Case of Postwar Japanese Capitalism". *Growth and Change* 25 (2) (1994): 247-262.

Frigon, A. "The Cat Model of Spinal Cord Injury", en *Animals Models of Spinal Cord Repair,* Hakan Aldskogius (ed.), 159-186. Uppsala, Sweden: Uppsala University, Department of Neuroscience, Biomedical Center, 2013.

Garfield, E., A. I. Pudovkin y V. S. Istomin. "Why Do We Algorithmic Historiography". *Journal of the American Society Information Science and Technology* 54 (5) (2003): 400-412.

Guertin, P. A. "The Spinal Cord: Functional Organization, Diseases, and Dysfunctions", en *Animals Models of Spinal Cord Repair,* Hakan Aldskogius (ed.), 1-24. Uppsala, Sweden: Uppsala University, Department of Neuroscience, Biomedical Center, 2013.

Ibarrola, M. "La impronta genética del Cinvestav. Una mirada a la excelencia de la institución entonces y ahora", en *Trayectoria de sus departamentos, secciones y unidades: 1961-2001,* Cinvestav, 11-51. México: Cinvestav, 2002.

Latour, B. "On actor-network theory - A few clarifications". *Soziale Welt-Zeitschrift fur Sozialwissenschaftliche Forschung und Praxis* 47 (4) (1996): 369-381.

Law, J. "Notes on the theory of the actor network-ordering, strategy, and heterogeneity". *Systems Practice* 5 (4) (1992): 379-393.

Leydesdorff, L. "Eugene Garfield and Algorithms Historiography: Co-Words, Co-Authors and Journals". *Annals of Library and Information Studies* 57 (3) (2010):248-260.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.003

Manual de Santiago. *Manual de Santiago de internacionalización de la ciencia y la tecnología.* Buenos Aires: *REDES*, 2007.

Pickstone, J. V. "A Brief Introduction to Ways of Knowing and Ways of Working". *History of Science* XLIX (2011): 235-245.

"Working knowledge before and after circa 1800: Practices and disciplines in the history of science, technology and medicine". *Isis* 98 (3) (2007): 489-516.

Rexed, B. "A Cytoarchitectonic Atlas of the Spinal Cord in the Cat". *Journal of Comparative Neurology* 100 (2) (1954): 297-379.

"The Cytoarchitectonic Organization of the Spinal Cord in the Cat". *Journal of Comparative Neurology* 96 (3) (1952): 415-495.

Rosenblueth, A., J. Alanis y G. Pilar. "The Accessory Motor Innervation of the Diaphragm". *Archives Internationales de Physiologie et de Biochimie* 69 (1) (1961): 19-25.

Sollaci, L. B. y M. G. Pereira. "The introduction, methods, results, and discussion (IMRAD) structure: a fifty-year survey". *Journal of Medical Library Association* 92 (3) (2004): 364-371.

Vessuri, H. "El Centro de Investigación y de Estudios Avanzados del IPN (Cinvestav)", en *37 Modos de hacer ciencia en América Latina,* B. Hernando Gómez y S. Hernán Jaramillo (comps.), 25-47. Colombia: Tercer Mundo Editores, 1997.

Para citar este artículo:

Collazo-Reyes, Francisco, María Elena Luna-Morales y Evelia Luna-Morales. 2016. "Impronta genética institucional y desarrollo de identidad internacional: estudio bibliométrico sobre médula-espinal-gato en Cinvestav." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 39-58 . http://dx.doi.org/10.1016/j.ibbai.2016.10.003

Quality assessment of a Master in Documentation, Library and Archives Management of the Complutense University of Madrid.

Alicia Arias-Coello*
José Simón-Martín **
Clara Simón-Blas***

Received:
June 22, 2014.
Accepted:
April 17, 2016.

Abstract

This study offers an importance- satisfaction analysis of a master's degree program, whose objective is twofold: to assess students' ability to identify those attributes where actions are needed to improve the quality of the master's program, and the suitability of this feedback instrument in assessing the impact of these actions. The study employed three groups of students enrolled in the MA program in Documentation, Libraries and Archives Management of Complutense University of Madrid. The control group consisting of students enrolled before 2011 were asked to rate the importance of and their satisfaction with set of

* Universidad Complutense de Madrid, España. aarias@ucm.es
** Instituto Universitario de Evaluación Sanitaria; Universidad Complutense de Madrid, España. jsimon@ucm.es
*** Universidad Rey Juan Carlos, España. clara.simon.blas@gmail.com

30 attributes indicative of the quality of the master's program. Once the most important attributes were identified, the program implemented a series of improvement initiatives. The impact of these actions were assessed by the other two groups of students enrolled in the 2011-12 and 2012- 13 school years, respectively. The results show that the three groups rated the importance of each attribute similarly and that there has been a positive impact on student satisfaction as a result of the actions implemented.

Keywords: Quality of service, quality of postgraduate education, student survey, importance-performance matrix, educational marketing

Resumen

Evaluación de la calidad del Máster en Gestión de la Documentación, Bibliotecas y Archivos de la Universidad Complutense de Madrid

Alicia Arias-Coello, José Simón-Martín and Clara Simón-Blas

Este estudio describe la aplicación del análisis de importancia-satisfacción en un programa de máster universitario con la finalidad de conocer, por un lado, su capacidad para identificar, desde el punto de vista de los estudiantes, aquellos atributos sobre los que sería más necesario actuar con el fin de mejorar la calidad del máster y, por otro, su viabilidad como instrumento de retroalimentación para verificar el impacto de dichas actuaciones. El estudio se llevó a cabo en tres grupos de estudiantes matriculados en el máster en Gestión de la Documentación, Bibliotecas y Archivos de la Universidad Complutense de Madrid. El primer grupo, considerado como grupo control, estuvo constituido por los estudiantes matriculados antes del año 2011. A estos alumnos se les solicitó que valorasen los grados de importancia y de satisfacción con el desempeño de un conjunto de 30 atributos que resumían la calidad del máster. Tras la identificación de los atributos sobre los que era prioritario actuar, la organización del título implementó una serie acciones de mejora, cuyo impacto se evaluó en los otros dos grupos de estudiantes matriculados en los cursos 2011/12 y 2012/13 respectivamente.

Los resultados obtenidos muestran, en primer lugar, que los tres grupos han otorgado una valoración similar al grado de importancia de cada atributo y, en segundo lugar, se ha constatado el impacto positivo en la mejora de la satisfacción de los estudiantes como consecuencia de las acciones implementadas

Palabras clave: Calidad de servicio; Calidad en la formación postgraduada; Encuesta a estudiantes; Matriz de importancia-satisfacción; Marketing educativo..

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

Introduction

The current economic crisis in Spain is exerting a large impact on the operation of public universities, both in terms of their finances and in matters of the demands on admissions. In this context, it is for the first time since the outset of the crisis, a shift from ongoing growth in enrollment between 2008-2011 to a retreat of 0.6% in the classes of 2012-2013 and 2013-2014 (Ministerio de Educación, Cultura y Deporte, 2013). One of the likely causes of this decline is the rising rate of enrollment to 19.7% between the latter two classes and the decline in the supply of scholarships. With regard to master degree, the reduction in demand was 16%, largely because the increase in the cost of tuition in some case as much as 100%.

Faced with this situation, public universities are adopting structural reforms aimed at adjusting their broad course offerings to actual demand and improving their competitive position versus other universities and thereby attract more students. Likewise, they are developing methodologies aimed at evaluating the satisfaction of students with regard to their educational experience in order to adapt the degree offering to the needs and expectations of the same, in order to secure a better competitive position with respect other universities that offer similar courses of study.

Most of the strategies enacted by these universities for evaluating the quality of the educational offerings through student perceptions are based on measuring student satisfaction with diverse aspects of the teaching, support services, environment of the same, etc., without taking into account that for most students not all of the attributes carry the same importance, a fact that universities should take into account, because, according to Elliot and Healy (2001), the university should achieve maximum satisfaction of their students in those requirements associated with the teaching services and the educational environment, which are most important to them.

One of the most useful and simple approaches for simultaneously measuring the importance of the diverse attributes of a service and the satisfaction of the student as a result of their use is the importance-satisfaction analysis introduced in 1977 by Martilla and James. This technique has as its purpose facilitating the selection of those features of the service shoes improvement should maximize client satisfaction. The analysis is based on the hypothesis that satisfaction is a variable that depends on two components: the importance of the product or service to the client and the performance of the organization in supplying this product and service; and thereafter, one queries the user of the service to learn their opinion regarding the importance of each of these attributes and the degree of satisfaction in accord with their experience in the use of the product or service.

To perform the analysis of importance-satisfaction of the served or product, a two-dimensional graph is used that plots satisfaction on the X axis and importance on the Y axis. This graph, (Figure1) is divided into four quadrants, using a reference point that is the average value for the scale employed, or the global mean obtained for satisfaction and importance (for a discussion on the type of measure that is best, see Oh, 2001 and Olujide and Mejabi, 2007). Each quadrant combines the degree of importance and satisfaction assigned by the client for each attribute of the product or service, and the strategy that best serves to improve client satisfaction. Inthis way, the attributes located within quadrant A are those where importance is rated high and satisfaction low. This quadrant is labeled “concentrate here,” meaning that these are the attribute that require urgent action and which should be deemed priorities.

The item located in quadrant B are those that are rated high in importance and high in satisfaction: these may well be deemed strengths of the organization and they should be upheld. For this reason quadrant B is labled “keep up the good work.” Quadrant C group together those attributes of low importance and low satisfaction, and is therefore labeled “low priority.”

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

Finally, quadrant D brings together those attribute of low importance with high satisfaction. This quadrat is labeled: "likely waste of resources."

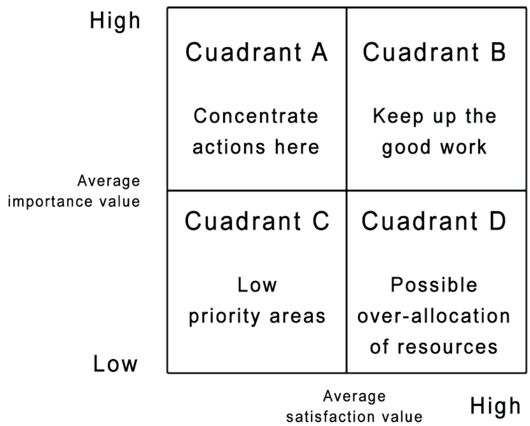


Figura 1. Importance-satisfaction matrix (Adapted from Martilla and James, 1977)

Since Joseph and Joseph (1997) and Ford, Joseph and Joseph (1999) first used the importance-satisfaction analysis to assess the perception of students as to the quality of education they receive in universities in New Zealand, this technique had been used on numerous occasions in areas including curricular assessment (Nale et al., 2000); quality of e-learning (Martinez-Caro, Cegarra-Navarro and Cepeda-Carrión, 2014); quality of university digital library service (Wright y O'Neill, 2002); evaluation of teaching (Yu and Ueng, 2012); quality of university educational service (Elliot and Healy, 2001; Pike, 2004; Douglas, Douglas and Barnes, 2006; Angell, Heffernan and Megicks, 2008; Silva and Fernandes, 2010; Yildiz, 2014); evaluation of the most important attributes in the choosing a university (Joseph, Yakhou and Stone, 2005; Bionel Tejedor, 2013), quality of services offered by university administrative departments (Kitcharoen, 2004; O'Neill and Palmer, 2004), attributes needed by a business degree graduates in the opinion of employers (Daud et al., 2011).

Even when the potential of the importance-satisfaction analysis is quite broad, there are two areas in which its use has so far been somewhat limited.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December 2016, México, ISSN: 0187-358X, 59-80

The first of these areas is post-graduate studies, where we find only a study by Angell, Heffernan and Megicks (2008) who used the approach to assess the service offered by the Faculty of Social Science and Business of the University of Plymouth (UK). If we consider, however, that the application of this methodology to postgraduate studies is useful in light of the differences that exist, a least in Spain, between undergrad and post-grad programs, including the higher tuition fees of the latter and that this cost is most often absorbed by the students themselves. Likewise, most master's degree students often work at jobs, which means they demand more flexibility in learning approaches and curricular content that supports their professional competencies allowing them to move up professionally and generally improve their professional trajectory. In the second place, it would be helpful to have more experiences regarding the usefulness of this technique as a mechanism for following up improvement initiatives implemented after the identification of weakness in the quality of services. In this sense, only Yu and Ueng (2012) have employed this approach to evaluate the impact of a project aimed at improving the quality of teaching delivered by professors.

This study presents the results of the application of the importance-satisfaction analysis in the Master's degree Programs in Documentation, libraries and Archives offered by the

Universidad Complutense de Madrid (Spain), for the purpose of verifying, in the first place, its usefulness in the process of selection of those attributes management needs improve; and in the second place, its role in the follow up and analysis of the effectiveness of said improvements.

Methodology

The questionnaire employed in this study was developed through a two-stage process. In the first stage, 22 students currently studying or nearly finished with their master's degrees were selected. Using an informatics support, each student was presented nine thematic blocks that address 31 aspects associated with the master's degree studies. *(Table 1)*. Regarding these aspects, the student is required to indicate those requirements they "like or would like" in the program, and those they "dislike or would dislike."

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

Tabla 1. List of thematic blocks and topics to consider in each block

Thematic block	Topics
Access to MA studies	MA program information and publicity Ability to become a candidate from diverse undergrad areas Pre-enrollment process Enrollment process
MA program objectives	Theoretical and practical knowledge students should acquired Professional competencies students should acquire
MA program of studies	Contents Content organization Content level Relationship between theory and practice
Development of teaching-learning processes	Teaching of theory in classroom Practical activities in the classroom (presentations, case studies, etc.) Non-classroom activities (information searches, group work, etc.) Activities using online platform Site visits Seminars and workshops Conferences Didactic materials Tutorials
Evaluation process	Attributes of a good assessment in coursework
Professor	Attributes of good professor
Support services	Library Complaints, claims and suggestions process Faculty and MA program administration Student liaison office Cafeteria
Infrastructure	Classroom Internet access Computer room and software available

In the second stage, the commentaries of each of the students on each aspect queried were analyzed and turned into requirements or attributes that, in the view of the participants in the study, they would like to see in the master's degree program. Of the total set of quality requisites identified, thirty were selected and presented to the same group in order to verify their degree of clarity and comprehension. In this way, the final questionnaire of thirty items was developed, in which each question required respondents to assess the degree of importance of the requirement and the degree of satisfaction with the same on a scale of one to ten.

Using an informatics application that employs email as a communications medium, the questionnaire was sent to 123 students that had been enrolled in the program in 2008-09, 2009-10 and 2010-11. Sixty-three students (51%) responded and six of these questionnaires were discarded because they were incomplete. This same questionnaire was sent to students enrolled in 2011-2012 and 2012-2013, in order to measure the impact of the improvement actions implemented in 2011 and 2012. The number of students enrolled in 2011-2012 was 66, and it was responded by forty students, a 60.6% response rate. For the 2012-2013 class, the number of students enrolled was 52, of which 44 responded to the questionnaire, a response rate of 84.6%.

To verify the reliability of the questionnaire, the Crombach alfa coefficient was calculated for the importance and satisfaction scales, which came to a value above 0.94, accepting their reliability in accord with the criteria cited by Hair et al. (2009).

The data gathered in the questionnaire were processed using version 19 of the IBM-SPSS statistical program. The mean value and standard deviation for each item were calculated and, in order to discover whether there were differences in the valuations made by the respondents, two contrasting hypotheses were posited. The first hypothesis test is performed for the purpose of contrasting the existence or non-existence of differences in valuations of each item on the questionnaire. For this purpose, a confidence interval of 95% (a=0.05) was considered for the mean values of importance and satisfaction. Since of the number of respondents in each group was greater than 30, the Central Limit Theorem was used to calculate the confidence interval.

The second hypothesis test employed run performed for the purpose of contrasting the existence or non-existence of the differences between the values of the global averages of importance and satisfaction between the three groups of students. The confidence intervals were built using methodology of Wu and Shieh (2009), for the case of distance variances.

Results

In this section, the first thing to be analyzed is the stability of opinions regarding the importance of each requisite of the master's degree program. In the lines below, the opinions of students enrolled in course before 2011 are

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

analyzed. Finally, the results obtained from this group of students, which was used as a control, are compared to the results from students enrolled in the two next courses, i.e., 2011-2012 and 2012-2013. This is done for the purpose of analyzing the impact of the improvement actions implemented by the administration in the master's degree program.

Opinion on the degree of importance of the quality requirements of the master's degree program.

Table 2 shows the means of importance and satisfaction for each of the quality requirements of the master0's degree program, according to the opinions of students enrolled before 2011 and the classes of 2011-2012 and 2012-2013.

Table 2. Average values of importance and satisfaction of MA student classes enrolled before 2011, for the class of 2011/12 and for 2012/13

Attributes of the master's degree program	Before 2011		2011-2012		2012-2013	
	Imp.	Sat.	Imp.	Sat.	Imp.	Sat.
A1. The information on the Master's degree program is clear, sufficient and well structured.	7.93	5.49	8.26	6.41	8.59	6.43
A2. The information on course content is available during the pre-enrollment and enrollment periods.	7.54	5.19	8.4	6.78	8.84	6.35
A3. The master's degree program offers up to date knowledge on the technological tools (TIC) applied to documentation	8.98	5.69	9.05	6.35	9	6.36
A4. The master's degree program trains the student to hold a job immediately that responds to current demands.	8.98	5.33	8.98	5.43	9.3	5.5
A5. The master's program offers sufficient opportunities for specialization.	9	6.64	8.67	6.62	9.02	7.23
A6. The master's degree program course contents are of a higher level than those offered in undergraduate coursework.	9.17	5.68	8.57	5.14	8.85	5.95
A7. Teachers explain to students how to perform each of the practicums associated with the coursework and how these are related to theory.	8.94	6.82	8.67	7.55	9.16	6.84
A8. The time devoted to practical activities of coursework should be more than that devoted to theory.	7.83	6.13	7.75	6.87	8.41	6.5
A9. The distribution and organization of the master's degree program coursework ensure the progressive acquisition of knowledge for the student.	9	5.78	8.8	6.28	8.86	6

A10. The selection of specialties or schedules should not require a student to choose a specific turn.	9.2	4.4	8.46	4.03	8.47	6.51
A11. The coursework practicum requires candidates to increase their use of ICT and Web 2.0.	8.46	5.83	8.5	6.33	8.45	6.39
A12. The organization of the mater's program offers students sufficient time to carry out non-classroom requirements (library research and study, etc.) for the purpose of broadening their knowledge.	8.66	6.02	8.93	6.28	9	6.3
A13. The professors use the virtual campus as a tool for teaching.	8.26	6.48	8.65	8.05	8.73	7.59
A14. The organization of the master's program favors student visits to professional organizations and entities so they can experience the genuine professional environment.	8.44	6.24	8.65	5.68	8.84	6.95
A15. The organization of the master's program favors the use of workshops and seminars for acquiring professional abilities.	8.31	5.58	8.7	6.28	8.59	6.57
A16. The master's program should offer the opportunity to hear the experiences of acknowledged professionals.	8.47	6.35	8.73	6.38	8.45	6.8
A17. The didactic materials used in coursework and provided to students to support study and practicums (notes, presentations, practicum guides, exercise, etc.) are clearly presented and well organized.	9.15	6.17	9.03	6.68	9.16	6.93
A18. The master's degree program offers online tutoring.	8.3	4.87	7.62	6.79	8.05	6.25
A19. The methods of evaluation of the master's program are ongoing and are largely performance or project based.	8.54	6.8	8.7	7.62	8.8	7.36
A20. The evaluation criteria are known at the outset of all program courses and classes.	8.89	6.46	9.07	7.18	9.23	6.59
A21. The teachers are accessible and polite in and outside of the classroom.	9.43	8.37	9.23	8.95	9.41	8.59
A22. The teachers have deep knowledge of their subjects, as well as experience in the professional or research field.	9.51	7.67	9.5	8.33	9.55	7.91
A23. The teachers have communication skills needed to transmit knowledge.	9.38	7.2	9.53	7.53	9.41	7.3
A24. The library participates in teaching activities of the master's program (offering course and coursework practicums, etc.)	8.31	5.54	7.67	4.9	8.26	5.49
A25. The complaints, claims and suggestion process is effective and has the power of reach resolution.	8.64	5.29	8.32	5.81	8.9	6.92

A26. The Student Liaison Office has the faculties needed to orient students and resolve administrative problems associated with graduation.	9.13	5.63	9.1	7.1	9.02	6.76
A27. The standard classrooms provide sufficient conditions in terms of temperature, lighting, internet access, electrical outlets, seating, work tables, projectors, blackboard, and projection screens.	8.83	6.34	9.13	6.85	9.16	7.25
A28. The general conditions of the computer rooms --in terms of numbers of computer units, printers, projectors, screens seats, tables, maintenance, air conditioning, availability and internet connection offer sufficient degree of quality to allow non-classroom activities to be performed adequately under good conditions must ensure adequate quality to prevent teaching problems	9.08	6.26	9.05	6.93	9.16	7.57
A29. The general conditions of the computer rooms --in terms of numbers of computer units, printers, projectors, screens seats, tables, maintenance, air conditioning, availability, internet connection and hours of service-- offer sufficient degree of quality to allow non-classroom activities to be performed adequately under good conditions must ensure adequate quality to prevent teaching problems	8.69	5.94	8.85	6.38	8.86	7.25
A30. The faculty offers facilities such as Wi-Fi and internet connections.	9.44	7.47	9.2	8.26	9.57	8.98
Overall average value	8.75	6.12	8.73	6.67	8.90	6.84

As shown in *Table 2*, the valuations of students of these three groups of the importance of each of the quality requirements are very close, with significant differences at a confidence level of 95% on requirement number 2 between the control group (mean value of 7.54) and the 2013-2013 class (mean value of 8.84). There were no significant differences between the global mean values of the importance assigned by each group.

Opinion of students enrolled in 2011-2012 class

Table 2 shows the most important master's degree program requirements from the point of view of students are those associated with the attributes that professor must bring to the table, such as knowledge, experience, availability and communication abilities, which were also those that obtain a higher satisfaction.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

In Figure 2 shows the results of the mean values of importance and satisfaction. In this graph data have been distributed across the four quadrants, which are built in accord with a separation frontier comprised of the aggregate mean values of importance (8.75) and satisfaction (6.12) of the data obtained from students enrolled in the master's program before 2011. These values are those that are used as a control in order to see the impact of the actions to be implemented in the classes of 2011/2013 and 2012/2013.

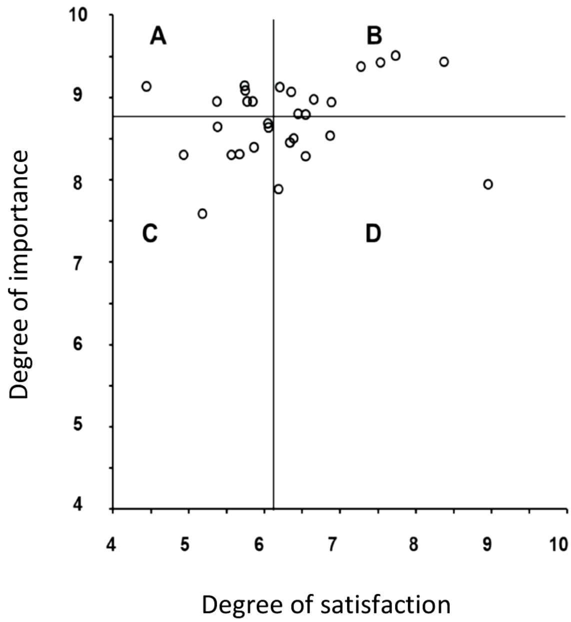


Figura 2. Importance-satisfaction matrix values of the group of students enrolled in course before 2001

As can be seen in *Figure 2*, there are six attributes located in quadrant A. These can be deemed these improvement priorities for increasing student satisfaction. These attributes are as follows, with the mean values of importance (I) and satisfaction (S) are provided in parenthesis:

- A10 The selection of specialties or schedules should not require a student to choose a specific turn ((I=9.20; S=4.40).
- A4 The master's degree program trains the student to hold a job immediately that responds to current demands (I=8.98; S=5.33).
- A6 The master's degree program course contents are of a higher level than those offered in undergraduate coursework (I=9.17; S=5.68).

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

- A26 The Student Liaison Office has the faculties needed to orient students and resolve administrative problems associated with graduation (I=9.13; S=5.63).
- A3 The master's degree program offers up to date knowledge on the technological tools (TIC) applied to documentation (I=8.98; S=5.69).
- A9 The distribution and organization of the master's degree program coursework ensure the progressive acquisition of knowledge for the student (I=9.00; S=5.78).

Figure 2 shows the existence of three attributes that are located very close to quadrant A. Because of the small sample size of 65 students and the degree of variability, we may believe that there inclusion is in this quadrant is somewhat less than solid. Said attributes as A17, falling in to quadrant B, and A29 and A12 which fall into quadrant C:

- A29 The general conditions of the computer rooms --in terms of numbers of computer units, printers, seats, tables, maintenance, air conditioning and hours of service-- offer sufficient degree of quality to allow non-classroom activities to be performed adequately under good conditions (I=8,69; S=5,94).
- A12 The organization of the mater's program offers students sufficient time to carry out non-classroom requirements (library research and study, etc.) for the purpose of broadening their knowledge (I=8,66; S= 6,02).
- A17 The didactic materials used in coursework and provided to students to support study and practicums (notes, presentations, practicum guides, exercise, etc.) are clearly presented and well organized (I=9,15; S=6,17).

The attribute receiving the worst satisfaction valuation in this group of students is A10 of *Table 2*. This could be because the master's degree program is offered in the morning and afternoon shift, with different specialization courses offered in each shift. This situation caused considerable dissatisfaction among students in the focus group participating in the selection of attributes. As shown in the observation of *Table 2* and *Figure 2*, the deficiencies most frequently cited have to do with the attributes associated with the organization of activities, the course contents, the facilities used and the role of the support services of the Student Liaison Office.

Impact of the implementation of actions to improve quality of master's degree program.

The aforementioned results provide the basis for analyzing the effects of a series of actions implemented by the degree program administration in 2011 and 2012. These actions are described *Table 3*. The objectives of these actions are, on one hand, to improve the satisfaction of students regarding those attributes falling into quadrant A in *figure 2*, and, on the other, to potentiate the use of information and communication technologies by the faculty, competencies needed to improve the use the of the virtual teaching platform.

Table 3. Improvement actions implemented by the faculty administration of the master's program.

Actions with effects in 2011-12	Actions with effects in 2012-13
• Revision of MA program modules in order to update and increase technological content. • Increased time devoted to practical activities. • Improvement of knowledge regarding the MA program held be student liaison office and improved communication between program authorities and personnel. • Improved information targeted to students through revising and modifying web page and issue of program pamphlet. • Installation of two new computer rooms for MA candidates. • Supporting professors' use of the e-learning platform in order to deliver tutoring, materials and information, and other communication activities.	• Reorganization of program courses offering into two semesters so that the required courses are organized by specialization and the number of electives is increased to three. • Reorganization of coursework calendar in order to provide enhanced cohesion to learning. • Offering all of the specializations of the MA program in a single afternoon schedule in order to help candidates who work in the morning. • Improving professors' knowledge of how to use the new e-learning platform in order to offer the MA program in mixed online-classroom modality in the short term. • Expanded informatics resources.

To learn the impact of these action, students were surveyed using the same questionnaire used with the control group one month after the conclusion of the course. Table 2 shows the results for the degree of importance of each of the program quality requirements and the degree of satisfaction expressed by the students.

Opinion of student enrolled in class of 2011-2012

The group enrolled in 2011-2012 expressed a more favorable opinion than that of the control group, with a global satisfaction score of 6.71 versus 6.12 for the control group. This difference was significant, with a confidence interval of 95%.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

Figure 3 shows the distribution of the mean values of importance and satisfaction of students enrolled in the class of 2011-2012. An examination of these results allows us to make the following observations:

- There is only one attribute that remains in quadrant A. This attribute is A4 The master's degree program trains the student to hold a job immediately that responds to current demands (I=8.98; S=5.43).
- Of the other five attributes that had been in quadrant A for the control group, three of these have moved to quadrant B (A3, A9 and A26), while the other two (A10 and A6) shifted to quadrant C as a result of the decreased importance score reported by students of the 2011-2012 cohort. Nevertheless, there are not significant differences between the valuations of the two groups of students for these fives requirements.

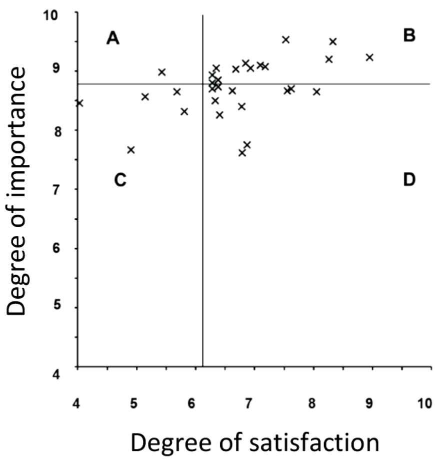


Figura 3. Importance-satisfaction matrix values of the group of students enrolled in 2011-2012 course

Moreover, there are two other attributes for which students of the 2011-12 cohort exhibit a mean degree of satisfaction that is higher than that for the control group. This value is significant with a confidence interval of 95%):

- A2 "The information on course content is available during the pre-enrollment and enrollment periods" (satisfaction of 6.78 this 5.19). This requirement moves from quadrant C to D.
- A13 "The professors use the virtual campus as a tool for teaching" (satisfaction of 8.05 versus 6.48). This requirement remains in quadrant D.

In short, we can assert that improvement plans implemented during the 2011-2012 period exerted a more significant impact on those attributes that are directly related to the improvement actions initiated, such as the training of faculty in the use of technologies and the improvement made to the program's webpage. Ony requirement A4 (The master's degree program trains the student to hold a job immediately that responds to current demands) still needs actions to improve satisfaction of students. Moreover, the result indicate that when actions are implemented to improve technological contents, the practicum sessions were insufficient to ensure improvement in satisfaction.

Results of students enrolled in class of 2012-2013

The students from the 2012-2013 cohort are generally more persons expressing satisfaction with the performance of quality attributes of the master's program than the previous two groups. In fact, the aggregate mean satisfaction came to 6.84 with a 95% confidence interval, significantly higher than the control group of 6.12, and slightly higher than the value of 6.71 of the student from the 2011-2012 cohort. *(Table 2).*

Figure 4 shows the distribution of the mean values for importance and satisfaction of the students enrolled in the 2012-2013 academic course. In accord with Figure 4 and the result of *Table 2*, three attributes are found in quadrant A:

- Attribute A4, (The master's degree program trains the student to hold a job immediately that responds to current demands) remained in this quadrant for the three groups of the students analyzed, perhaps owing to the fact that in the view of the students no direct improvement action has been implemented.
- Attribute A6 (The master's degree program course contents are of a higher level than those offered in undergraduate coursework) undergoes a series of shifts. The control group had this attribute in quadrant A, while the 2011-2012 cohort has it in quadrant C as the mean value of importance declined. Nonetheless, there were no significant differences in the mean values of importance and satisfaction assigned by the three groups of students for this attribute.
- As for A9 (The distribution and organization of the master's degree program coursework ensure the progressive acquisition of knowledge

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

for the student), the control group fell into quadrant A, while the 2011-2012 cohort sample put it in quadrant B with a higher mean satisfaction value. In this case, it is important to note that one of the projects implemented in this class was specifically aimed at improving the results of this attribute, which suggests that the new organization proposed has not been effective in the eyes of students. Nonetheless, it is important to note that there were no significant differences in the mean values for importance and satisfaction in the three groups of students for this attribute.

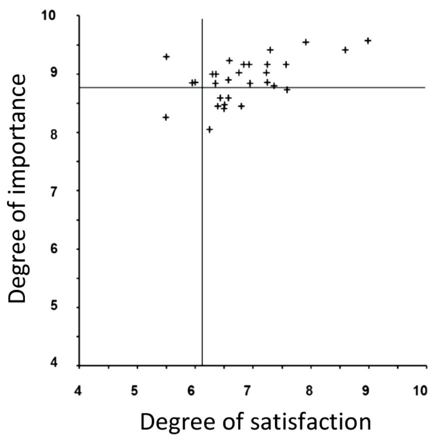


Figura 4. Importance-satisfaction matrix values of the group of students enrolled in 2012-2013 course

An analysis of the results obtained for each of these attributes, we find that there are six attributes with a mean valuation of satisfaction in a confidence interval of 95% greater for the 2012-2013 cohort sample than that reported for the control group:

- A2 (The information on course content is available during the pre-enrollment and enrollment periods) (satisfaction of 6.78 versus 5.19). The control group was in quadrant C, which shifts to quadrant B.
- A10 (The selection of specialties or schedules should not require a student to choose a specific turn) (satisfaction of 6.51 versus 4.40). The control group
- Had this attribute in quadrant A, which shifted to quadrant D, perhaps because all of the courses were offered in only one turn and is no longer a motive for dissatisfaction.

- A18 (The master's degree program offers online tutoring) (satisfaction of 6.25 versus 4.87). This attribute moves from C to D.
- A28 (The general conditions of the computer rooms --in terms of numbers of computer units, printers, projectors, screens seats, tables, maintenance, air conditioning, availability and internet connection offer sufficient degree of quality to allow non-classroom activities to be performed adequately under good conditions must ensure adequate quality to prevent teaching problems) (satisfaction of 7.57 versus 6.34). This attribute remained in quadrant B.
- A29 (The general conditions of the computer rooms --in terms of numbers of computer units, printers, seats, tables, maintenance, air conditioning and hours of service-- offer sufficient degree of quality to allow non-classroom activities to be performed adequately under good conditions) (satisfaction of 7.25 versus 5.94). This attribute moves from C to B.
- A30 (the Faculty offers facilities such as Wi-Fi and internet connections (satisfaction 8.98 versus 7.47). This attribute remains in quadrant B.

Likewise, with significance in 90% confidence interval, another four attributes for the 2012-2013 cohort sample show an average satisfaction valuation higher than the control group:

- A1 The information on the Master's degree program is clear, sufficient and well structured (satisfaction of 6.43 versus 5.49). The control group had it in quadrant C and this moved to quadrant D.
- A13 The professors use the virtual campus as a tool for teaching (satisfaction of 7.59 versus 6.48). This attribute remains in quadrant D.
- A25 The complaints, claims and suggestion process is effective and has the power of reach resolution (satisfaction of 6.92 versus 5.29). The control group has this attribute in quadrant C, and it has shifted to quadrant B.
- A26 The Student Liaison Office has the faculties needed to orient students and resolve administrative problems associated with graduation (satisfaction of 6.76 versus 5.63). The control group has this attribute in quadrant A, and it has shifted to quadrant B.

The preceding examples of significant improvements in student satisfaction in this class serve to reflect the impact of the actions implemented

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December 2016, México, ISSN: 0187-358X, 59-80

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

in 2011/2012 and 2012/2013. Similarly, there are three attributes associated with the coursework contents, seasonal programming, and the relevance of the master's program in professional life that should be analyzed further in order to propose actions for their improvement.

Conclusions

This study proposes the use of analysis of the student valuations of the importance and satisfaction to identify the strengths and weaknesses of the organization in the performance of the quality attributes of the master's degree program. This analysis is used to verify the impact of the actions implemented by and organization it improve performance.

To achieve a better valuation with each requirement of the effects of the actions on satisfaction of the students, we have considered the sample variability of each of the mean values of importance and satisfaction, indicating the degree of probability when there is a difference in the valuations made by students belonging to the several academic cohorts. Taking into account these methodological aspects, we take not of the following three facts:

- The stability of time, and between the different groups of students, of the mean valuations of importance they assigned to each of the attributes of the Master's Degree Program in Documentation, Library and Archive Administration.
- The results presented suggest that the improvement in satisfaction of students with the performance of some quality attributes of the program are the consequence of the actions implemented, as was the case with the requirements associated with the installations, availability of information, freedom to choose a specialty, use of TIC to support teaching or the improvement in the operation of the student Liaison Office.
- There are other requirements of great importance to students, which do not modify their level of satisfaction. Among these, the most important is associated with the usefulness of the training provided in the master's degree program to students in view of current demands, as they attempt to move into the workplace immediately after graduation.

All of the actions implemented for improving satisfaction with this requirement have had a negative results and, possibly, it is owing to the short duration of the master's program (two semesters), which on one hands does not allow inclusion more activities directly associated with the competencies needed to effectively hold a job successfully, and on the other, impede the introduction of a period of external practicums in order to provide the student with experience in a professional setting.

Finally, this methodology is useful for identifying those attributes that are crucial in the improvement of the satisfaction of students and as a feedback mechanism for following up on and objectively verifying the impact of actions aimed at improving the quality of the attributes deemed priority from the viewpoint of students.

References

Angell, R. J., T. W. Heffernan y P. Megicks. 2008. "Service quality in postgraduate education", *Quality Assurance in Education* 16 (3): 236-254.

Bionel Tejedor, A. 2013. "Matriz de "importance performance analysis" de atributos críticos de satisfacción de alumnos en ciencias y tecnología y medidas correctivas frente a la meta-acreditación institucional", *Ciencia y Tecnología* 13: 11-24.

Daud, S., N. Abidin, N. M. Sapuan y J. Rajadurai. 2011. "Enhancing university business curriculum using an importance-performance approach: A case study of the business management faculty of a university in Malaysia", *International Journal of Educational Management* 25 (6): 545-569.

Douglas, J., A. Douglas y B. Barnes. 2006. "Measuring student satisfaction at a UK university", *Quality Assurance in Education* 14 (3): 251-267.

Elliot, K. M. y M. A. Healy. 2001. "Key factors influencing student satisfaction related to recruitment and retention", *Journal of Marketing for Higher Education* 10 (4): 1-11.

Ford, J. B., M. Joseph y B. Joseph. 1999. "Importance performance analysis as a strategic tool for service marketers the case of service quality perceptions of business students in New Zealand and USA", *The Journal of Services Marketing* 13 (2): 171-184.

Hair, J. F., W. C. Black, B. J. Babin y R. E. Anderson. 2009. *Multivariate Data Analysis,* 7a ed., Upper Saddle River, New Jersey: Prentice Hall.

Joseph, M. y B. Joseph. 1997. "Service quality in education a student perspective", *Quality Assurance in Education* 5 (1): 15-21.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December 2016, México, ISSN: 0187-358X, 59-80

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.004

, M. Yakhou y G. Stone. 2005. "An educational institution's quest for service quality: customer's perspective", *Quality Assurance in Education* 13 (1): 66-82.

Kitcharoen, K. 2004. "The importance-performance analysis of service quality in administrative departments of private universities in Thailand", *ABAC Journal* 24 (3): 201-216. Fecha de consulta: 10 de enero de 2014, http://ejournal.narotama.ac.id/files/ajvol24n3_article3.pdf

Martilla, J. A. y J. C. James. 1977. "Importance-performance analysis", *Journal of Marketing* 41 (1): 77-79.

Martínez-Caro, E., J. G. Cegarra-Navarro y G. Cepeda-Carrión. 2014. "An application of the performance-evaluation model for e-learning quality in higher education", *Total Quality Management,* http//dx.doi.org/10.1080/14783363.2013.867607

Ministerio de Educación, Cultura y Deporte. 2013. *Datos básicos del sistema universitario español. Curso 2013/2014,* 10 de febrero de 2014, http://www.mecd.gob.es/dms/mecd/educacion-mecd/areas-educacion/universidades/estadisticas-informes/datos-cifras/DATOS_CIFRAS_13_14.pdf

Nale, R. D., D. A. Rauch, S. A. Wathen y P. B. Barr. 2000. "An exploratory look at the use of importance analysis as a curricular assessment tool in a school of business", *Journal of Workplace Learning* 12 (4): 139-145.

Oh, H. 2001. "Revisiting importance-performance analysis", *Tourism Management* 22: 617-627.

Olujide, O. J. y O. V. Mejabi. 2007. "Methodological issues in importance–performance analysis: Resolving the ambiguity", *European Journal of Social Sciences* 4 (2): 7-21.

O'Neill, M. A. y A. Palmer. 2004. "Importance performance analysis a useful tool for directing continuous quality improvement in higher education", *Quality Assurance in Education* 12 (1): 39-52.

Pike, S. D. 2004. "The use of repertory grid analysis and importance-performance analysis to identify potential determinant university attributes", *Journal of Marketing for Higher Education* 14 (2): 1-8.

Silva, F. y P. Fernandes. 2010. "Using importance-performance analysis in evaluating institutions of higher education: A case study", *Proc. 2010 International Conference on Education and Management Technology* (ICEMT 2010) 4: 121-123. Fecha de consulta: 20 de enero de 2014, http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05657689

Wright, C. y M. O'Neill. 2002. "Service quality evaluation in the higher education sector: An empirical investigation of students' perceptions", *Higher Education Research &Development* 21 (1): 23-39.

Wu, H. H. y J. I. Shieh. 2009. "The development of a confidence interval- based importance-performance analysis by considering variability in analysing service quality", *Expert Systems with Applications* 36 (4): 7040-7044.

Yildiz, S. M. 2014. "Service quality evaluation in the school of physical education and sports: An empirical investigation of students' perceptions", *Total Quality Management* 25 (1): 80-94.

Yu, K. T. y R. G. Ueng. 2012. "Enhancing teaching effectiveness by using the Six-Sigma DMAIC model", Assessment & Evaluation in Higher Education 37 (8): 949-961.

Para citar este artículo:

Arias-Coello, Alicia, José Simón-Martín y Clara Simón-Blas. 2016. "Evaluación de la calidad del Máster en Gestión de la Documentación, Bibliotecas y Archivos de la Universidad Complutense de Madrid." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 59-80. http://dx.doi.org/10.1016/j.ibbai.2016.10.004

O domínio de organização do conhecimento na base BRAPCI: uma análise estatística

Miguel Romeu Amorim Neto *
Marcia Heloisa Tavares de Figueredo Lima **

Received:
June 17, 2014.
Accepted:
February 24, 2015.

Resumo

Investigação analítico-quali/quantitativa detectando o domínio de Organização do Conhecimento frente à produção brasileira de artigos de periódicos de Ciência da Informação a partir de levantamentos realizados na Base de Dados Referencial de Artigos de Periódico em Ciência da Informação. O objetivo geral da pesquisa foi analisar comparativamente a ocorrência numérica absoluta e relativa de artigos de periódicos brasileiros da área de CI sobre a temática Organização do Conhecimento cobertos na base BRAPCI de 1972 a 2012 através de recortes temático-conceituais. Apresenta conceituações para a compreensão da Organização do Conhecimento, a partir da abordagem

* Universidade Federal do Rio de Janeiro, Rio de Janeiro RJ, Brasil. miguel@sibi.ufrj.br
** Universidade Federal Fluminense, Niterói RJ, Brasil. marciahelolima@gmail.com

da Análise de Domínio de Hjørland e Albrechtsen (1995), a qual permitiu que fossem identificados os conceitos pertencentes da OC. Para atender aos objetivos de pesquisa, utilizaram-se técnicas quantitativas de avaliação da produção científica como método de análise dos dados recuperados na BRAPCI e análise qualitativa dos resultados. Estas sinalizaram que o Domínio de OC está em expansão no Brasil ao contrário do cenário internacional.

Palavras-chave: Organização do Conhecimento; Base de dados; BRAPCI; Comunicação científica; Bibliometria; Análise quantitativa; Produtividade Relativa; Meta-análise.

Abstract

Domain of knowledge organization represented in the BRAPCI base: a statistical analysis

Miguel-Romeu Amorim-Neto and *Marcia-Heloisa Tavares-de-Figueredo-Lima*

Investigation qualitative and quantitative analysis detecting the domain of Knowledge Organization front of the whole area of information science from surveys conducted in Referential Database Journal Articles in Information Science. The objective of the research is to analyze the occurrence numerical absolute and relative articles of Brazilian journals of information science on the topic covered in the Knowledge Organization based BRAPCI 1972-2012 through conceptual-themed cutouts. Presents concepts for understanding the Organization of Knowledge, from the approach of Domain Analysis of Hjørland and Albrechtsen (1995), which allowed them to be identified concepts of belonging OC. To meet the research objectives, we used quantitative techniques for assessing the scientific literature as a method of analyzing the data retrieved in BRAPCI and qualitative analysis. This signaled that the domain OC is expanding in Brazil unlike the international scene.

Keywords: Knowledge Organization; Database; BRAPCI; Scientific Communication; Bibliometrics; Quantitative analysis; Relative Productivity; Meta-analysis.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

Introdução

Este trabalho relata resultados de pesquisa que teve como meta verificar a importância relativa da Organização do Conhecimento nos periódicos de Ciência da Informação no Brasil, considerando que diversas pesquisas sinalizavam uma diminuição da importância relativa do domínio de OC em relação a outras temáticas.

Da inicial (e quase exclusiva) preocupação sobre as formas de tratar a informação, o que chamamos de domínio de Tratamento da Informação (TI), a Ciência da Informação (CI), a partir de 1985 vê um movimento de reflexão epistemológica de autores na CI que mapearam os temas de pesquisa privilegiados no campo, demonstrando, a partir da identificação das temáticas centrais de artigos de periódicos, que mudam os focos da pesquisa na área e há um crescente interesse por outras temáticas.

Nos parágrafos seguintes apresentamos um resumo de seis artigos que apresentam propostas de esforços classificatórios com sentido epistemológico e nos demonstram essa mudança.

Atkins (1988) em um estudo com um recorte temporal de 10 anos - 1975-1984 - nas revistas consideradas mais prestigiadas pela comunidade (*College CL Research Libraries, Library Quarterly, Journal of Academic Librarianship, Information Technology and Libraries, Library Resources CL Technical Services, Library Trends, ASIS Journal, Library Journal* e *American Librarie*s), coletou dados de 2 705 artigos, chegando a um total de 4 688 assuntos reduzidos ao final da pesquisa em uma lista de 57 assuntos (*list of subjects*) dominantes. Suas conclusões foram que o assunto mais frequente é a gestão de bibliotecas, seguido por uma grande concentração de assuntos relacionados com a automação de acervos, como recuperação da informação, bancos de dados, catalogação, automação de bibliotecas, tecnologia e métodos de investigação. Devemos ressaltar que o único ponto negativo de seu artigo é que o autor não disponibiliza a categorização dos assuntos de sua lista, e que por isso não pode ser melhor explorado para comparação com outros autores.

Jarvelin e Vakkari (1993), realizando uma pesquisa internacional com quarenta periódicos, distribuída por tópicos, sobre quais as abordagens e métodos têm sido utilizados na Biblioteconomia e Ciência da Informação (BCI ou, em inglês, Libray and Information Science - *LIS*) a partir de amostras publicadas em 1965, 1975 e 1985, destacam que classificação e indexação, recuperação da informação e as profissões foram naqueles períodos, respectivamente, os tópicos mais publicados. Por outro lado, o estudo demonstrou que houve alterações notáveis nas tendências dos estudos em subcategorias destes tópicos, destacando-se um decréscimo significativo de

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

interesse pelos estudos sobre metodologia e análise da BCI (*LIS*), bem como o decréscimo de interesse sobre a temáticas como armazenamento e recuperação de informação (a publicação sobre a temática "classificação e indexação" passou de 22 % para 6 %) enquanto houve um aumento de produção de artigos sobre recuperação da informação a partir dos problemas dos usuários (de 4 % para 13 %). Este estudo nos forneceu um primeiro panorama da BCI como um todo e as subáreas.

No estudo desses autores foi possível observar que o domínio de Organização do Conhecimento (doravante OC) denominado Sistemas de Informação e Recuperação [*Information Systems and Retrieval* - IS&R] representa sucessivamente nas três amostras 32.4 % em 1965, 26.2 % em 1975, voltando a crescer para 29.2 % em 1985. Isso significa que nos anos 1960 e 1980 este domínio representou a maior área temática de sua amostra. Ainda neste domínio IS&R, o tópico Recuperação da Informação [*Information Retrieval*] além de constante crescimento (4.2, 7.8 e 12.7 %) foi o maior item individual de pesquisa na década de 1980. O item de pesquisa Classificação e Indexação [C*lassification and Indexing*] pertencente ao mesmo domínio, chegou a representar sozinho, mais de 20 % dos artigos publicados, tendo representado 21.8 % na década de 1960, 13.6 % na década de 1970, caindo finalmente para 5.6 % na década de 1980. Observando-se ainda que as "populações" de artigos estudados cresceu em termo absolutos (de 142 em 1965 para 449 em 1985), observa-se que o número absoluto de artigos não teve um decréscimo tão significativo, pois se na amostra de 1965 foram produzidos cerca de 30 artigos, na amostra de 1985 foram produzidos cerca de 25 artigos. Houve portanto um grande crescimento da área de CI com um pequeno decréscimo na produção absoluta sobre OC e uma marcante diminuição relativa.

O quadro classificatório de Jarvelin e Vakkari (1993), inspirou Cano (1999), a realizar também um estudo bibliométrico da BCI (LIS) na literatura espanhola a partir da produção total de dois grandes periódicos (*Revista Espanhola de Documentación Cientifica* e a *Documentación de las Ciencias de la Información*), no período de 1977-1994. Trabalhando com um total de 354 artigos, o autor observou que, de modo geral, "como toda literatura de L & IS, na Espanha parece ser igualmente distribuídos entre os artigos que abordam atividades de serviços L & IS (ou BCI), Armazenamento e Recuperação da Informação e Estudos de Comunicação Científica e Profissional" (Cano, 1999: 677-678) como termos / palavras / conceitos mais pesquisados. O exame individual da distribuição dos temas por revista mostra uma distribuição diferente dos tópicos apresentados pelos dados agregados, e tal fato é consequência, segundo o autor, provavelmente, da diferença nas metas e objetivos do CINDOC – editor da *Revista Espanhola de Documentación Cientifica* - uma

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

instituição do governo espanhol responsável pela divulgação de informação científica e técnica em todo o país e do Departamento de Documentação da Universidad Complutense de Madrid – editor da *Documentación de las Ciencias de la Información* - que reflete os interesses de um currículo escolar, localizado dentro do maior departamento de estudos da comunicação do país (Cano, 1999: 677-678).

Interessado no movimento de "acesso aberto" (*open access*-OA), Mukherjee (2009) investigou o impacto da LIS em periódicos eletrônicos de OA e analisou 17 periódicos eletrônicos de acesso totalmente abertos, publicados ininterruptamente durante o período 2000-2004, em termos de artigos, autores, instituições, países, assuntos e referências citadas. Um ponto negativo a ser mencionado sobre esse artigo, é que o autor sugere ter identificado o núcleo de periódicos eletrônicos em OA da LIS, entretanto, essa afirmação pode ser questionada, pois os periódicos analisados pelo autor possuem uma grande dispersão geográfica (o estudo inclui periódicos da África do Sul e da China), mas não são citados periódicos latino-americanos ou, sequer, ibéricos, fato que nos causa estranheza, pois nos perguntamos por que o estudo realizado por um autor espanhol não os considerou.

Neste estudo, as palavras-chave dos títulos foram classificadas em quatro níveis, sendo utilizadas as descrições da abrangência de assuntos do Jita Plano de Classificação de Biblioteconomia e Ciência da Informação.[1] Os resultados demonstram que o assunto predominante foi a Tecnologia da Informação (308 artigos), seguido de Fontes de Informação (245 artigos) e o terceiro assunto mais frequente foi Tratamento da Informação para os Serviços de Informação (185). Outros temas de marcante interesse nesta amostra foram Tecnologia de Computadores para Biblioteca, Bibliotecas Digitais, Aplicações de TI (169 artigos), Conhecimento e Aprendizagem (124 artigos) (Mukherjee, 2009: 187-189).

Outro autor que se dedicou aos estudos métricos mais recentemente foi Aharony (2011), que analisou os periódicos top 10 na BCI de 2007-2008 segundo uma lista que inclui os 10 periódicos mais citados no período, pelo seu fator de impacto segundo o Journal Citation Report (JCR) de 2008 e refletindo um fator de impacto médio de 1,57. Dos 10 periódicos selecionados,[2] seis são revistas de Ciência da Informação e quatro são revistas de graduação em BCI. A investigação estatística descritiva realizada em 1 250 artigos foi

1 http://eprints.rclis.org/cms/jita
2 Os periódicos da lista "top 10" são: *Journal of the American Society for Information Science and Technology, Scientometrics, Journal of Information Processing & Management, Journal of Computer-Mediated Communication, Journal of Information Science, Journal of Documentation, Information Research, College & Research Libraries, Library & Information Science Research, Journal of Global Information Management.*

seguido por uma análise de conteúdo aprofundada em 417 artigos (33 %). A análise de conteúdo com 856 palavras-chaves foi baseada no esquema de classificação da Ciência da Informação de Zins (2007). O resultado mostra que 17.99 % das palavras-chave estão associadas com a tecnologia da informação, seguidas por 17.40 % da metodologia, o Aspecto Social da Ciência da informação responsável por 17.05 %, e a organização de dados e recuperação por palavras-chave de 12.50 % (Aharony, 2011: 30-31).

O último trabalho examinado foi o relatório produzido pelo Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT). Trata-se de um mapeamento de números temáticos indexados em bases de dados internacionais da área de BCI (Information Science & Technology Abstracts - ISTA, Library, Information Science & Technology Abstracts with Full Text - LISTA/FULL e Library and Information Science Abstracts - LISA), no período de 2005-2010, disponíveis no Portal de Periódicos da Capes. A análise de conteúdo foi baseada em 185 números temáticos publicados em periódicos (themed issue; special issue) e 77 trabalhos na categoria painéis apresentados em 2 congressos da American Society for Information Science and Technology (ASIS&T), de 2008 e 2009, e distribuídos em 11 categorias do Information Science Taxonomy (Hawkins, Larson e Caton, 2003). O resultado demonstrou que as categorias de Pesquisa em Ciência da Informação, Bibliotecas e Serviços Bibliotecários e Questões Sociais contem os assuntos mais pesquisados em periódicos e congressos. Já as categorias de Tecnologias da Informação, Indústria da Informação, Informação e Questões Governamentais e Legais, e Organização do Conhecimento possuem grandes diferenças entre as publicações em periódicos e congressos.

Quadro 1. Variações no Monitoramento internacional da produção científica em CI

Categorias	Periódicos		Congresso		Totais
	Nº na categoria	% Acumulado na faixa	Nº na categoria	% Acumulada na faixa	Nº nas categorias
Pesquisa em Ciência da Informação	37 (20 %)	20 %	31 (40 %)	40 %	68 (26 %)
Bibliotecas e Serviços Bibliotecários	32 (17 %)	37 %	12 (16 %)	56 %	44 (17 %)
Questões Sociais	26 (14 %)	51 %	12 (16 %)	72 %	38 (15 %)
Tecnologias da informação	26 (14 %)	65 %	6 (7.5 %)	79,5 %	32 (12 %)
Indústria da Informação	17 (9 %)	74 %	3 (4 %)	83,5 %	20 (7.6 %)
Informação e Questões Governamentais e Legais	17 (9 %)	83 %	3 (4 %)	87,5 %	20 (7.6 %)
Organização do Conhecimento	12 (6 %)	89 %	6 (7.5 %)	95 %	18 (7 %)

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

Produção Editorial e Distribuição	8 (4 %)	93 %	--	--	8 (3 %)
Profissão da Informação	3 (2 %)	95 %	3 (4 %)	99 %	6 (2 %)
Fontes e Aplicações para Assuntos Específicos	4 (3 %)	98 %	--	--	4 (1.5 %)
Sistemas e Serviços de Informação Eletrônica	3 (2 %)	100 %	1 (1 %)	100 %	4 (1.5 %)

Fonte: o autor, baseado em IBICT (2011, v.1 e v.2)

A observação das seis pesquisas analisadas até aqui permite afirmar que houve uma mudança de foco da BCI, principalmente com os temas da Organização do Conhecimento (OC), decrescendo de foco principal para médio. Esse decréscimo nas pesquisas poderia ser decorrente das classificações que foram utilizadas, por isso, reproduzimos no quadro a seguir um comparativo dos termos utilizados para descrever a parte/subárea do domínio de OC em todos os estudos utilizado pelos autores aqui citados. Em todas as categorias utilizadas nos estudos relatados, vemos que um campo/área/domínio como a BCI (ou LIS) é constituído por temáticas, que podem ser analisadas como partes.

Quadro 2. Esquemas de Classificação de assunto na CI

Esquemas de classificação de assuntos			
Jarvelin e Vakkari (1993)	Jita Plano de Classificação de Biblioteconomia e Ciência da Informação	Zins' classification scheme (2007)	Hawkins, Larson e Caton (2003)
50 Information Searching &Retrieval Study on… 51. Cataloguing 52. Classification and indexing (process or languages) 53. Information retrieval 54. Bibliographic databases or bibliographies 55. Nonbibliographic data bases (textual, numeric...)	Information treatement for information services IA. Cataloguing, bibliographic control. IB. Content analysis. IC. Index languages, processes and schemes. ID. Data and metadata structures. IE. Knowledge representation. IF. Information transfer: protocols, formats, techniques. IG. Information presentation: hypertext, hypermedia. IH. Image systems. II. Filtering.	5. Data Organization and Retrieval – classification schemes, – metadata, – indexing, – text mining, – abstracting, – knowledge organization, – taxonomies, – thesauri, – ontology, – vocabulary control, – online searching techniques, – reference work, – the semantic web.	2. *Organização do conhecimento* 2.1 Tesauros, listas de autoridade Taxonomias, ontologias, redes semânticas, nomenclaturas, terminologias, vocabulários. 2.2 Catalogação e classificação Tags, metatags, metadados, Dublin Core (Dublin Core Metadata Initiative-DCMI), identificadores de objetos digitais (digital object identifiers-DOIs), catálogos para acesso público em linha

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

	IJ. Reference linking. IK. Design, development, implementation and maintenance. IZ. No one of these, but in this section.		(online public access catalogs-OPACs), formato MARC (Machine-Readable Cataloging), Código de Catalogação Anglo-Americano (AACR, 2. ed.), mapas tópicos, processos e teorias de catalogação 2.3 Elaboração de resumos, indexação, revisão Indexação e resumos automáticos 2.4 Padrões e protocolos National Information Standards Organization (NISO), Z39.5, XML, SGML, HTML, arquivos abertos (Open Archives Initiative-OAI), Encoded Archival Description (EAD), OpenURL, portable document format (PDF)

Fonte: o autor, baseado em Jarvelin e Vakkari (1993); Jita Plano de Classificação de Biblioteconomia e Ciência da Informação (http://eprints.rclis.org/cms/jita); Aharony (2011: 29-30); IBICT (2011, v.1 e v.2)

Os estudos realizados por Jarvelin e Vakkari (1993), Cano (1999), Mukherjee (2009), Aharony (2011) e IBICT (2011, v.1 e v.2) demonstraram uma tendência de diminuição numérica relativa de ocorrências de artigos discorrendo sobre o domínio da Organização do Conhecimento na área de Ciência da Informação, e esta diminuição relativa passa a constituir um problema quando a confrontamos com o discurso de Hjørland (1998: 610) quando este afirma que análise de assunto dos documentos (Organização do Conhecimento) é a atividade mais importante feita pelos bibliotecários e profissionais de informação.

Assim, propusemos como objetivo geral analisar comparativamente a ocorrência numérica absoluta e relativa de artigos de periódicos brasileiros da área de Ciência da Informação (CI) sobre a temática Organização do Conhecimento (OC) cobertos na Base Referencial de Artigos de Periódicos em

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

Ciência da Informação (BRAPCI)[3] de 1972 a 2012 através de recortes temático-conceituais.

Os objetivos específicos decorrentes do objetivos geral foram: a) identificar a ocorrência numérica relativa e absoluta dos artigos de periódicos relativos à organização do conhecimento através de recortes temático-conceituais e b) identificar dentre os periódicos da CI brasileiros o núcleo mais devotado à OC.

Metodologia

Esta pesquisa é descritiva e quantitativa, utilizando de métodos bibliométricos que se inserem nas metodologias estatísticas de coleta e análise de dados. Utilizado ainda da classificação de Fonseca (1986: 10-11), podemos adicionar o caráter especializado ou microbibliométrico dessa pesquisa dado ao seu objeto de estudo.

A opção pelo uso de metodologias quantitativas se deu ainda porque possibilitou investigar "a extensão na qual as variações em um fator correspondem às variações em um ou mais fatores, baseados em coeficientes de correlação" (Preti, 2006: 13).

A aplicação desses métodos quantitativos às bases de dados permite meta-análises por reunir e (re)combinar "[...]os resultados de outros estudos realizados de forma independente (geralmente extraídos de trabalhos publicados) e sintetizar suas conclusões ou mesmo extrair uma nova conclusão" (Luiz, 2002: 409). Para o mesmo autor uma meta-análise permite uma reflexão crítica (Luiz, 2002: 410).

Ainda segundo Flick (2004, em Braga, 2007: 27) as análises quantitativas possibilitariam, provavelmente em momento posterior e supomos, via análise qualitativa "isolar claramente causas e efeitos, operacionalizar corretamente relações teóricas [...]".

Deste modo, ainda que se recorra a métodos quantitativos, podemos considerar que essa pesquisa tem um aporte analítico-qualitativo, uma vez que

3 BRAPCI é o resultado do projeto de pesquisa *Opções metodológicas em pesquisa: a contribuição da área da informação para a produção de saberes no ensino superior*, sendo mantida pelo Grupo de pesquisa Educação, Pesquisa e Perfil Profissional em Informação (E3PI) da Universidade Federal do Paraná (UFPR). Sendo um projeto financiado pelo CNPq, A base BRAPCI vem sendo utilizada para pesquisas de tendências epistemológicas através da análise dos movimentos de produção sobre certos temas na Ciência da Informação, por exemplo, pelo Grupo de Pesquisa Informação, Discurso e Memória, coordenado pela professora Lídia Silva de Freitas. Desde sua tese de doutorado apresentada à ECA/USP, desenvolveu uma metodologia de recortes temático-discursivos que, na época, foi aplicada a dois periódicos. Atualmente a Base é composta por 37 periódicos nacionais impressos e eletrônicos da área de CI, 26 estão ativos e 11 históricos (descontinuados).

as questões levantadas nos objetivos específicos da pesquisa foram formuladas no sentido de entender uma série de fenômenos, dentre eles: o surgimento e o envelhecimento dos temas de pesquisa atinentes à Organização do Conhecimento, quem são os principais autores brasileiros.

As pesquisas quali-quantitativas, se por um lado, traduzem em números as opiniões e informações para serem analisadas e classificadas através da produção de tabelas e gráficos estatísticos (Cordeiro, 2012: 30), por outro lado, permitem inferências analíticas de nível qualitativo em geral feitos a partir do levantamento dos dados. Para realizarmos esta modalidade híbrida de pesquisa, percorremos as seguintes etapas.

Levantamento de conceitos ligados à Organização do Conhecimento nos ENANCIBs

O levantamento dos conceitos da OC foi realizado sem o uso de motores de busca nos anais disponíveis no Portal da ANCIB[4] dos anos de 2003 a 2009 e nos endereços dos sites que hospedaram o evento nos anos de 2010,[5] 2011[6] e 2012.[7]

Foram levantados e incluídos os conceitos atribuídos como palavras chaves pelos autores que publicaram nos Grupos de Trabalhos 2 e 8 dos Encontros Nacionais de Pesquisa em Ciência da informação – ENANCIBs, considerando os critérios de avaliação desses encontros, que os caracterizam como "superformais" e que estes representariam a frente de pesquisa no Brasil (Braga, 1973). Nas palavras de Salek (2011: 57):[8] "a comparação entre as frequências das categorias analíticas permite observar que os trabalhos dos ENANCIBs apresentam uma aparente maior 'cautela' na adesão a modismos e/ou noções com fraca fundamentação teórica".

> A justificativa para uma aparente inversão da qualidade científica entre as duas fontes, que transparece na utilização ou não de terminologia e conceitos científicos e na adesão ou não a modismos pouco aprofundados pode estar na dupla orientação do campo — voltado 'à explicação e à intervenção nos processos humanos de conhecimento, memória, comunicação'. (González de Gómez, 2000 em Salek, 2011: 57).

4 http://www.ancib.org.br/pages/anais-do-enancib.php
5 http://congresso.ibict.br/index.php/xi/enancibXI
6 http://congresso.ibict.br/index.php/xii/enancibXII
7 http://www.enancib2012.icict.fiocruz.br/
8 Aqui citamos um TCC (literatura cinzenta) que foi considerado o melhor produzido no âmbito do curso de Biblioteconomia da UFF no ano de 2011 e premiado como o melhor da Região Sudeste pela Associação de Ensino em Biblioteconomia (ABECIN, 2014).

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

A superformalidade de avaliação pelos pares no ENANCIB legitimaria os relatos de pesquisa concluídos (apresentados oralmente) ou em desenvolvimento (apresentados em formato de pôsteres) como representativos da frente de pesquisa brasileira neste domínio. Do mesmo modo, essa avaliação garantiria a legitimidade de reificação dessas temáticas como objeto de pesquisa neste domínio.

Os sinais de separação entre os conceitos, tais como ponto, virgula ou ponto e virgula, não foram considerados como sinais de pré-coordenação. De modo contrário, termos unidos por hífen foram analisadas como um único conceito. Segundo Lancaster (2004, cap. 4) a hifenização de termos para construção de índices pré-coordenados é uma escolha arbitrária do indexador, com vistas a representar um assunto unidimensionalmente.[9]

Ainda quanto à pré-coordenação de termos, nos casos em que foram encontrados conceitos correspondentes, estes foram computados como único conceito. Por exemplo: Representação da informação e Representação - Informação.

Também adotamos esse critério de equivalência para conceitos grafados em outras línguas, sendo assim, foram computados junto com seus correspondentes em português no singular, por exemplo: Thesaurus ou Tesauros, formam computados como Tesauro. Outro critério observado para nove conceitos específicos foi adequá-los à forma ortográfica com preposições diferentes (de ou da), no plural, no singular e acrônimos (siglas), para que fossem computados na forma como a maioria dos autores utiliza nos descritores ou palavras-chave dos seus trabalhos nos ENANCIBs.

Fo excluídos da análise 17 artigos não apresentam palavras-chave.

Assim, a extração de conceitos foi realizada a partir de uma amostra de 376 trabalhos publicados nos GT 2 e GT 8.[10] A partir das palavras-chaves foram identificados 919 conceitos dos quais somente 238 foram considerados pertencentes ao domínio da OC. A falta de uniformidade dos conceitos falseia o número de ocorrências, pois as flexões nominais e numéricas fazem conceitos iguais aparecerem com ocorrências diferentes, de modo que estas diferentes formas de enunciação estão apresentadas, portanto, de forma "bruta" não servindo para uma posterior análise.

9 Ainda segundo Lancaster (2004: 52-53) para que um índice pré-coordenado permita mais que uma dimensão na representação é necessário um processo de alternação, rotação, ou deslocamento dos termos ou conceitos.

10 O *Gráfico 2* demonstra a variação da quantidade do número de trabalhos publicados por anos nesses GTs. Devido à falta de espaço será apresentado como documento suplementar.

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

Acesso à Base BRAPCI *e identificação e extração dos dados da base*

A base empírica para essa dissertação foi formada a partir da seleção de artigos de periódicos brasileiros indexados na Base BRAPCI.

Cada conceito mapeado foi pesquisado através do mecanismo de busca utilizando aspas (“”)[11] limitando-se ainda a busca apenas nas palavras-chave. A razão para trabalharmos apenas sobre o campo de busca das palavras-chaves é que os termos indexados representariam a centralidade das enunciações das temáticas principais dos artigos na visão dos próprios autores.

Construção de planilhas para análise de dados

Após o acesso e consulta aos artigos, as palavras-chave atribuídas pelos autores foram extraídas, exportadas e arranjadas em planilha eletrônica (software Excel).

A seleção dos artigos foi realizada a partir do seguinte parâmetro:

- abrangência da área de assunto claramente exposta nas palavras-chave, permitindo identificação e enquadramento nos termo da área temática da pesquisa: OC;

A visualização destes elementos apresentados em todos os registros recuperados pela base fez necessária uma arrumação de forma a serem trabalhados de acordo com nossa necessidade. Os registros na BRAPCI foram (re) formatados em planilha Excel, conforme o *Quadro 3*:

Quadro 3. Modelo utilizado para reformatar dados em planilha Excel

Número	Título	Autor	Periódico	Ano	Seção	Palavras-chave
1	Construção de linguagens documentárias em sistemas de recuperação da informação: a importância da garantia do usuário	Oliveira, Dalgiza Andrade; Araújo, Ronaldo Ferreira de	Encontros Bibli: Revista Eletrônica de Biblioteconomia e Ciência da Informação	2012	Artigo	Garantia do usuário; Organização do conhecimento; Tesauros; Representações documentárias; Indexação

11 Assim como os operadores booleanos (and, or, not), as aspas são comando padrão universal em mecanismos de busca para recuperar informação na forma exata que se deseja. Na própria BRAPCI é informado na tela principal, abaixo da caixa de busca, que para termos compostos as aspas deve ser usadas.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

Após a coleta e (re)formatação padronizada dos dados, realizamos um estudo comparativo que nos possibilitou mensurar, analisar e diagnosticar qual é a importância relativa da Organização do Conhecimento na Ciência da Informação no Brasil, mas especificamente quem escreve, quais tipos de material são mais utilizados, em quais periódicos mais pública, entre outras características.

É valido ressaltar que a todo o momento adotamos a posição de simples consulentes ou usuários das plataformas web, de maneira que não mantivemos nenhum tipo de contato com os gestores do Portal da ANCIB ou da base BRAPCI.

Resultados

Das 238 palavras-chave pertinentes ao domínio da Organização do Conhecimento extraídas dos trabalhos no GT2 e 8 dos anos de 2003 a 2012, apresentados na seção 2.5, 127 (53.4 %) apresentaram resultados ao serem pesquisados na BRAPCI, os outros 111 (46.6 %) não tiveram nenhuma incidência de documentos.

Merecem destaque ainda que trabalhos recuperados por quatro conceitos não foram contabilizados na análise, pois iriam comprometer os resultados, são eles: “Conceito”, “Relacionamento”, “Representação” e “Informação – Representação”. O primeiro apresentou um número de documentos em sua grande maioria tratando de epistemologia, como exemplos, o “conceito de informação na Ciência da Informação” ou “conceito de biblioteca” etc. Todos os documentos indexados pela base por “Conceito” que pertenciam ao domínio da OC foram indexados também com outros descritores mais específicos, portanto, já estando cobertos na análise.

Já o conceito de “Relacionamento” só apresentou resultados abordando os fatores psicológicos, como exemplo: entre bibliotecários e usuários, entre unidades de informação e seus clientes etc.

O termo e conceito de “Representação”, por ser muito genérico, também apresentou um número considerável de trabalhos abordando a representação social de indivíduos em grupos minoritários, da mesma forma, seus trabalhos não foram contabilizados para não comprometerem os resultados dessa pesquisa. Cabe ressaltar que antes de tomarmos essa decisão foi feita pesquisa sobre os conceitos de “Representação descritiva” e “Representação temática”, pois ambos são foco da OC. Em ambos as conceitos, os artigos recuperados já estavam cobertos na análise, sendo indexados por outros conceitos como exemplo “Catalogação” e “Tesauro”.

A relação de termos "Informação – Representação" recuperou apenas um trabalho na seção Temas da revista Transinformação. O trabalho de Jardim, José Maria, "Informação e representação social", *Transinformação* 8 (1) (jan./abr.), 1996, que discute a representação social de um sujeito a partir de seu papel de agente propagador de informações, por não se tratar de Organização do Conhecimento, fez com que o mesmo não fosse contabilizado.

Após a reformatação ainda foi necessário um processo de deduplicação a fim de eliminar dados de artigos com mais de uma ocorrência, em que foi possível identificar a republicação de 3 artigos, todos contabilizados uma única vez.

Ao final, alcançamos o total de 750 artigos no período de 1972 a 2012, sobre os quais faremos nossas considerações a seguir.

Produção relativa sobre organização do conhecimento

Este primeiro resultado diz respeito ao objetivo "a".
Considerando o total de documentos incluídos na base no período 1972-2012 (7 754) e o total de documentos sobre Organização do Conhecimento no mesmo período, 750, chegamos ao percentual de 9.7 % para responder, então, ao nosso objetivo "a". Este percentual é muito próximo dos resultados no Monitoramento internacional da produção científica em CI realizado pelo IBICT (2011, v.1 e v.2) no qual chegou a um resultado de 7 % somando os trabalhos publicados em periódicos e congressos.

Especificamente sobre o domínio da Organização do Conhecimento observamos que o mesmo se encontra em expansão.

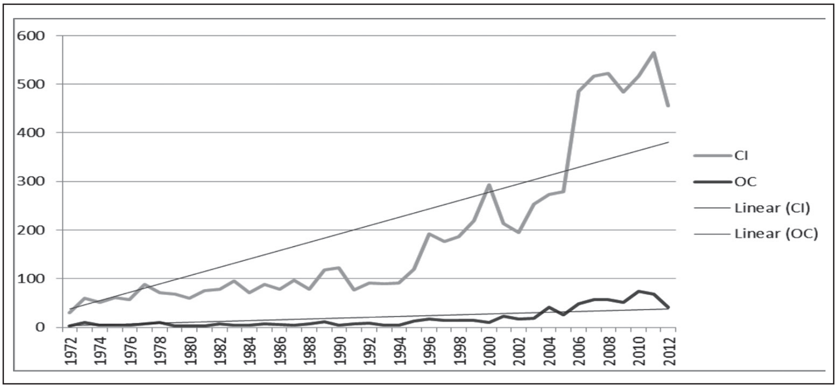


Gráfico 1. Comparativo entre o Domínio da OC e a CI
Fonte: O autor.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

No quadro a seguir observamos que em um período de seis anos (2006 a 2012) foram produzidos mais da metade do total de artigos concernentes ao domínio da OC do que todo o período de trinta e três anteriores (1972 a 2005).

Quadro 4. Produtividade relativa entre OC e CI

Ano	CI	%	∑ %	OC	%	∑ %	OC / CI
1972	30	0.4	0.4	3	0.4	0.4	10
1973	60	0.77	1.17	11	1.46	1.86	18.33
1974	52	0.67	1.84	5	0.67	2.53	9.61
1975	62	0.8	2.64	4	0.53	3.06	6.45
1976	57	0.74	3.38	4	0.53	3.59	7.02
1977	88	1.13	4.51	8	1.07	4.66	9.09
1978	72	0.93	5.44	10	1.33	5.99	13.88
1979	69	0.89	6.33	3	0.4	6.39	4.35
1980	60	0.77	7.1	3	0.4	6.79	5
1981	76	0.98	8.08	3	0.4	7.19	3.94
1982	79	1.02	9.1	8	1.07	8.26	10.13
1983	95	1.23	10.33	5	0.67	8.93	5.26
1984	72	0.93	11.26	4	0.53	9.46	5.56
1985	89	1.14	12.4	8	1.07	10.53	8.98
1986	78	1.01	13.41	6	0.8	11.33	7.69
1987	97	1.25	14.66	5	0.67	12	5.15
1988	78	1.01	15.67	7	0.93	12.93	8.97
1989	119	1.53	17.2	12	1.6	14.53	10.08
1990	123	1.59	18.79	4	0.53	15.06	3.25
1991	77	1	19.79	8	1.07	16.13	10.39
1992	91	1.17	20.96	9	1.2	17.33	9.89
1993	90	1.16	22.12	4	0.53	17.86	4.44
1994	92	1.19	23.31	5	0.67	18.53	5.43
1995	120	1.55	24.86	13	1.73	20.26	10.83
1996	193	2.49	27.35	18	2.4	22.66	9.33
1997	176	2.27	29.62	15	2	24.66	8.52
1998	187	2.41	32.03	14	1.87	26.53	7.49
1999	219	2.82	34.85	14	1.87	28.4	6.39
2000	294	3.79	38.64	10	1.33	29.73	3.4
2001	214	2.76	41.4	23	3.07	32.8	10.78
2002	195	2.51	43.91	18	2.4	35.2	9.23
2003	254	3.28	47.19	19	2.53	37.73	7.48
2004	274	3.53	50.72	42	5.6	43.33	15.33
2005	279	3.6	54.32	26	3.47	46.8	9.32
2006	485	6.25	60.57	49	6.53	53.33	10.1
2007	516	6.65	67.22	57	7.6	60.93	11.05
2008	522	6.73	73.95	57	7.6	68.53	10.92
2009	484	6.24	80.19	52	6.93	75.46	10.74

2010	516	6.65	86.84	74	9.87	85.33	14.34
2011	565	7.29	94.13	69	9.2	94.53	12.21
2012	455	5.87	100	41	5.47	100	9.01
Total	7754	100 %	100 %	750	100 %	100 %	

Fonte: O autor

Os resultados do gráfico e do quadro anteriores contradizem os resultados do estudos realizados por Jarvelin e Vakkari (1993), Cano (1999), Mukherjee (2009), Aharony (2011) e IBICT (2011, v.1 e v.2) de que a Organização do Conhecimento estaria sofrendo um processo de encolhimento frente a outras temáticas.

Pelos dados da nossa tabela é possível ver que 53.2 % da produção brasileira sobre o domínio de OC na CI foi publicada entre 2006 e 2012, e que os demais 46.8 % precisaram de 34 anos para serem produzidos sob a forma escrita. Observe-se ainda que se no ano de 1972 o domínio de OC representava 0.4 % da produção de artigos de CI no Brasil, a partir do ano de 2006 chega a 6.53 % e em 2011 chega a 9.2 %. O ano de 2012, mesmo que a cobertura não estivesse completa em abril de 2013 quando fechamos esse levantamento o domínio de OC já representava 5.47 % na área. Inegavelmente, esses 5.47 % significam que a OC decuplicou sua presença relativa na CI.

Considerando que o ano de 2012 não tinha ainda sua cobertura completa na base, podemos concluir que no Brasil, o domínio da OC ao contrário da tendência internacional está em relativa expansão mesmo frente a novas temáticas surgidas com os ambientes digitais (ou até por causa destes).

Produtividade relativa: periódicos da ci mais devotados a OC

Para atender ao nosso objetivo "b", devemos observar a produção de artigos de OC nos periódicos de CI. Onde dos 37 periódicos cobertos pela BRAPCI, 34 publicam artigos sobre a OC.

Observamos que a revista *Ciência da Informação* (139 artigos, 18.53 % da amostra) é a mais produtiva em relação ao domínio de OC. Tal fato pode ser encarado como normal por ser a publicação mais antiga na área de CI no Brasil estando corrente atualmente.

A surpresa nesta observação, foi a revista *DataGramaZero* (86 artigos, 11.46 % da amostra), que apesar de muito mais recente, tem um número considerável de publicações em OC, sendo inclusive superior aos números de publicações da revista *Perspectivas em Ciência da informação* (67 artigos, 8.93 % da amostra). Devemos destacar ainda que somente o somatório dos resultados da Revista da Escola de Biblioteconomia da UFMG – precursora da Pers-

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

pectiva – poderia superar o número de publicações da DataGramaZero, por uma diferença de apenas 7 artigos, o que incorreria em uma margem de erro de 0.9 %.

Em uma distribuição por zonas de produtividade podemos observar que as revistas *Ciência da Informação* e *DataGramaZero*, detém um terço (29.99 %) das publicações, portanto, se constituindo como núcleo de publicação do domínio de OC no Brasil. As revistas Perspectivas em Ciência da Informação, Transinformação, Encontros Bibli e Revista de Biblioteconomia de Brasília detém outro terço (29.73 %), portanto, se constituindo como zona transitória entre alta e baixa produtividade de publicações do domínio de OC no Brasil.

Consequentemente os 28 periódicos restantes se constituem como zona de dispersão das publicações sobre OC.

O *Quadro 5* e o *Gráfico 2* a seguir, demonstram essa observações da incidência de artigos de OC por periódico em números absolutos e percentuais.

Quadro 5. Produtividade de OC em periódicos

Zonas	Rank	Frequência	%	∑%	Titulo
1	1	139	18.53	18.53	*Ciência da Informação*
2	2	86	11.46	29.99	*DataGramaZero*
	3	67	8.93	38.92	*Perspectivas em Ciência da Informação*
3	4	60	8	46.92	*Transinformação*
	5	54	7.2	54.12	*Encontros Bibli*
	6	42	5.6	59.72	*Revista de Biblioteconomia de Brasília*
4	7	39	5.2	64.92	*Informação & Informação*
	8	33	4.4	69.32	*Informação & Sociedade: Estudos*
	9	30	4	73.32	*Revista Brasileira de Biblioteconomia e Documentação*
	10	26	3.46	76.78	*Revista da Escola de Biblioteconomia da UFMG*
	11	24	3.2	79.98	*Revista Digital de Biblioteconomia & CI*
5	12	21	2.8	82.78	*Revista ACB: Biblioteconomia em Santa Catarina*
	13	18	2.4	85.18	*Ponto de Acesso*
	14	13	1.73	86.91	*BIBLOS*
	15	12	1.6	88.51	*Biblionline*
	16	12	1.6	90.11	*Em Questão:*
	17	9	1.2	91.31	*Brazilian Journal of Information Science*
	18	9	1.2	92.51	*Revista Ibero-Americana de Ciência da Informação*
	19	8	1.06	93.57	*Informare:*
	20	7	0.93	94.5	*Arquivística.net*
	21	7	0.93	95.43	*InCID: Revista de Ciência da Informação e Documentação*
	22	5	0.66	96.09	*Liinc em revista*
	23	4	0.54	96.63	*Cadernos de Biblioteconomia*
	24	4	0.54	97.17	*Revista Eletrônica Informação e Cognição*
	25	3	0.4	97.57	*Comunicação & Informação*

	26	3	0.4	97.97	*Estudos Avançados em Biblioteconomia e CI*
	27	3	0.4	98.37	*ETD - Educação Temática Digital*
	28	3	0.4	98.77	*Revista do Departamento de Biblioteconomia e História*
	29	2	0.27	99.04	*Perspectivas em Gestão & Conhecimento*
	30	2	0.27	99.31	*Tendências da Pesquisa Brasileira em Ciência da Informação*
	31	2	0.27	99.58	*AtoZ: Novas Práticas em Informação e Conhecimento*
	32	1	0.14	99.72	*Arquivo & Administração*
	33	1	0.14	99.86	*Inclusão Social*
	34	1	0.14	100	*Revista de Biblioteconomia & Comunicação*
Total		750	100 %	100 %	

Fonte: Dados da pesquisa

Nos termos da Lei de Bradford, teríamos um periódico nuclear no domínio de OC, que sozinho publicou 139 artigos, formando a Z1 (zona 1), em seguida mais quatro zonas, cada uma com uma concentração numérica de artigos muito próxima da zona 1 (Z2=153, Z3=156, Z4=152 e Z5=150 artigos).

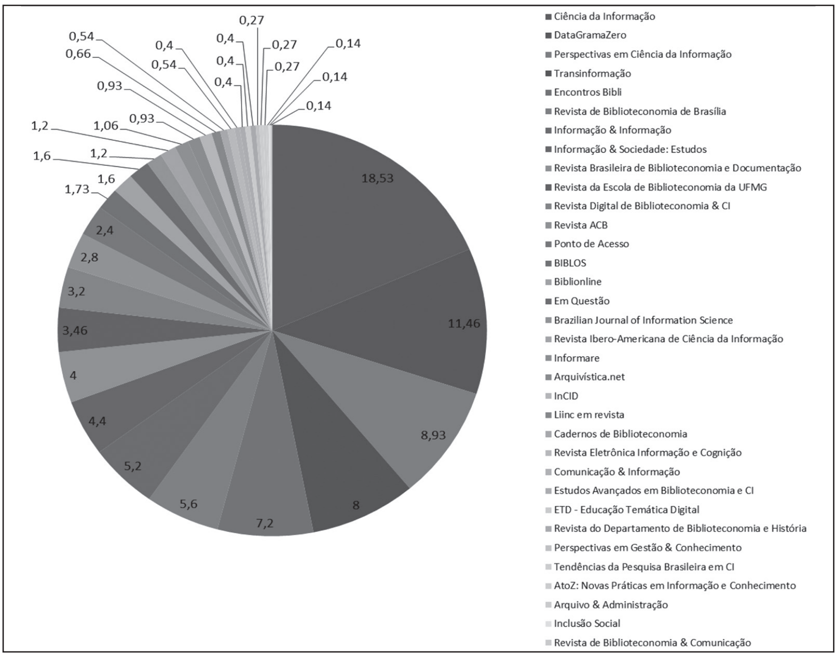


Gráfico 2. Incidência percentual de artigos de OC por periódico
Fonte: Dados da pesquisa

Diante dessas descobertas passemos às nossas considerações finais.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.005

Considerações finais

As questões levantadas permitiram caracterizar algumas práticas na produção das pesquisas sobre Organização do Conhecimento no Brasil e essa análise das práticas de produção escrita, feita a *posteriori*, sem dúvida, caracteriza como uma pesquisa qualitativa.

Primeiramente nosso mapeamento nos possibilitou identificar o domínio de Organização do Conhecimento a partir dos seus vários conceitos encontrados nas indexações presumivelmente autorais dos trabalhos do GT2 e GT8 publicados nos Anais dos ENANCIBs no período de 2003 a 2012. Esse passo foi descrito em nossa metodologia.

A partir deste pré-levantamento qualitativo, realizou-se um estudo quantitativo que nos possibilitou vislumbrar a produção brasileira no domínio de OC encontrada na base BRAPCI no período de 1972 a 2012, demonstrando que embora discreta em relação ao total da base, este domínio se encontra em crescimento. Isso foi demonstrado porque a média de publicações de 1972 a 2005 era em torno de 10.32 artigos por ano, ao passo que de 2006 a 2012 a média salta para 57 artigos por ano, representando uma alta maior que 500 % (551 %). Como comentado no final da seção "Produção relativa sobre organização do conhecimento", foi constatado que 53.2 % da produção brasileira sobre o domínio de OC na CI foi publicada entre 2006 e 2012 e que os demais 46.8 % dos artigos foram publicados nos 34 anos anteriores. Observou-se também que no ano de 1972 o domínio de OC representava 0.4 % da produção de artigos de CI no Brasil e a partir do ano de 2006 chegando a 6.53 % e em 2011 chegando a 9.2 %. No ano de 2012, mesmo que a cobertura não estivesse completa em abril de 2013 o domínio de OC já representava 5.47 % do total de artigos na CI. Inegavelmente, mesmo esse 5.47 % em 2012 significam que a OC decuplicou sua presença relativa na CI nos últimos 34 anos, pois era 0.4 % em 1972. Isso nos permite afirmar que no Brasil, contrariando a tendência internacional, a produção sobre OC está em crescimento relativo em relação à área de CI.

As observações decorrentes do nosso objetivo "b" constataram que nem todos os periódicos cobertos pela base BRAPCI publicam sobre o domínio de OC. A surpresa nessa observação foi um periódico mais recente ter uma produtividade relativa superior a um periódico com mais anos de publicação, respectivamente a DataGramaZero e Perspectivas em Ciência da Informação. Também observamos que publicação de artigos em OC segue o modelo de dispersão da literatura de Bradford, no qual os periódicos mais devotados podem ser organizados por zonas de dispersão, sendo o mais devotado à OC a revista Ciência da Informação.

Se por um lado, este artigo procurou ver o lugar epistemológico da Organização do Conhecimento na Ciência da Informação brasileira sob o aspecto da "moda" científica, seguindo os passos metodológicos indicados, consideramos ter sido possível responder à nossa questão de pesquisa, a qual permitiu observar que o domínio de Organização do Conhecimento, no Brasil, conforme demonstrado no *Gráfico 1*, encontra-se em crescente expansão. Este fato contraria análise de declínio com base nos mapeamentos realizados em âmbito internacional realizados por por Jarvelin e Vakkari (1993), Cano (1999), Mukherjee (2009), Aharony (2011) e IBICT (2011, v.1 e v.2).

Esta pesquisa não dá conta de todas as possibilidades de análise que poderiam ser feitas sobre o domínio da OC, por isso, nosso próximo passo são: os autores mais produtivos e a rede de colaboração entre os autores, o que com certeza revelará outras características como exemplo, o grau de colaboração entre as instituições e a instituição que possui maior incidência de pesquisadores de Organização do Conhecimento.

Deixamos assim um legado reflexivo e questões inseridas no âmbito da comunicação científica para nossas pesquisas não só sobre o domínio de OC, mas para todo o campo de CI no Brasil.

Referências

Aharony, N. 2011. "Library and Information Science research areas: A content analysis of articles from the top 10 journals 2007–8". *Journal of Librarianship and Information Science* 44 (1): 27-35.

ABECIN (Associação Brasileira de Educação em Ciência da Informação). 2014. *Concurso TCC: resultado 2012-2014.* Londrina: ABECIN. http://www.abecin.org.br/abecin_conteudo.php?id=9

Associação Nacional de Pesquisa e Pós-Graduação em Ciência da Informação. 2014. *Anais do ENANCIB.* Paraiba: ANCIB. http://www.ancib.org.br/

Atkins, S. E. 1988. "Subject trends in library and information science research, 1975-1984". *Library Trends* (36): 633-658. http://www.ideals.illinois.edu/ bitstream/handle/2142/7561/librarytrendsv36i4c_opt.pdf?sequence=1

Braga, Gilda Maria. 1973. "Relações bibliométricas entre a frente de pesquisa (research front) e revisões da literatura". *Ciência da Informação,* Rio de Janeiro, 2 (1): 9-73. http://revista.ibict.br/ciinf/article/view/20/20

—— 1996. "A representação da informação na desconstrução do contexto". *INFORMARE - Cadernos do Programa de Pós-Graduação em Ciência da Informação,* Rio de Janeiro, 2 (2) (jul./dez.): 53-57.

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

Braga, Katia. 2007. "Aspectos relevantes para a seleção de metodologia adequada à pesquisa social em Ciência da Informação", em Suzanna P. M. Mueller, *Métodos para pesquisa em Ciência da Informação*. Brasília: Thesaurus, 17-38.

Cano, V. 1999. "Bibliometric Overview of Library and Information Science Research in Spain". *Journal of the American Society for Information Science* 50 (8): 675-680. http://onlinelibrary.wiley.com/doi/10.1002/(SICI)1097-4571(1999)50:8%3C675::AID-ASI5%3E3.0.CO;2-B/pdf

Cordeiro, Helena C. D. 2012. *Direito à informação: um estudo informétrico na base RVBI (1988/2010).* Dissertação (Mestrado em Ciência da Informação) – PPGCI, UFF, Riode Janeiro.

Fonseca, E. N. (org.). 1986. *Bibliometria: teoria e pratica.* São Paulo: Cultrix: Ed da USP.

Hawkins, Donald T., Signe E. Larson e Bari Q. Caton. 2003. "Information science abstracts: tracking the literature of information science. Part 2 : a new taxonomy for information science". *Journal of the American Society for Information Science and Technology* 54 (8): 771-781.

Hjørland, B. 1998. "Theory and metatheory of Information Science: a new interpretation". *Journal of Documentation* 54 (5) (dez.): 606-621.

IBICT. 2011. *Monitoramento internacional da produção científica em ciência da informação*. Brasília, DF: IBICT, 2v. http://www.ibict.br/publicacoes-e-institucionais/monitoramento-em-ci/Monitoramento_int_producao_cientifica_em_ci_v1.pdf e http://www.ibict.br/publicacoes-e-institucionais/monitoramento-em-ci/Monitoramento_int_producao_cientifica_em_ci_v2.pdf

Jarvelin, K. e P. Vakkari. 1993. "The evolution of library and information science 1965 - 1985: a content analysis of journal articles". *Information Processing & Management* 29 (1): 129-144.

Lancaster, F. W. 2004. *Indexação e resumos: teoria e prática.* 2. ed. Brasília: Briquet de Lemos Livros.

Luiz, Alfredo J. B. 2002. "Meta-análise: definição, aplicações e sinergia com dados espaciais". *Cadernos de Ciência & Tecnologia*, Brasília, 19 (3) (set./dez.): 407-428.

Mukherjee, B. 2009. "Scholarly research in LIS open access electronic journals: A bibliometric study". *Scientometrics* 80 (1): 169-196. https://www.bhu.ac.in /dlis/archive/169_10-mukh2055_1.pdf. DOI: 10.1007/s11192-008-2055-2

Preti, Oreste. 2006. "Tipos de pesquisa", em *A aventura de ser estudante: um guia metodológico.* 2. ed. rev., 7-14. Cuiabá: EdUMFT.

Salek, Lídia Martini Coelho Brandão. 2011. *Artigos de periódicos e trabalhos apresentados em eventos: análise comparativa dos perfis temático-discursivos de diferentes fontes do campo informacional brasileiro*. Trabalho de Conclusão de Curso (Graduação em Biblioteconomia)–Universidade Federal Fluminense, Niterói.

Zins, Chaim. 2007. “Conceptions of Information Science”. *Journal of the American Society for Information Science and Technology* 58 (3): 335-350.

Para citar este artículo:

Amorim Neto, Miguel Romeu y Marcia Heloisa Tavares de Figueredo Lima. 2016. “O domínio de organização do conhecimento na base BRAPCI: uma análise estatística.” *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 83-104. http://dx.doi.org/10.1016/j.ibbai.2016.10.005

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, september/december, 2016, México, ISSN: 0187-358X, pp. 81-102

Transparent universities with transparent libraries

Ana R. Pacios

Received: August 28, 2014.
Accepted: February 24, 2015.

Abstract

This paper proposes transparency indicators for university libraries, while identifying areas of information relevant to the diverse public stakeholders, in view of good practices identified in libraries and other organizations in this field. In order to determine the degree of transparency of these libraries belonging to the *Madroño* consortium of Madrid, the existence of these indicators in their respective websites is assessed. A comparison of the degree of transparency of selected libraries to that of their respective universities reveals that some libraries could implement significant improvements, chiefly in the areas of visibility and currency of the information they offer, while also

* Universidad Carlos III de Madrid, España.areyes@bib.uc3m.es

incorporating relevant contents for their diverse interest groups.

Keywords: Transparency; Accountability; Spanish University Libraries; Indicators; Madroño Consortium.

Resumen

Universidades transparentes con bibliotecas transparentes

Ana R. Pacios

Se presenta una propuesta de indicadores ligados a la transparencia en las bibliotecas universitarias, identificando áreas informativas relevantes para los diversos colectivos o público interesado que tiene alguna relación con ellas (stakeholders). Se han tenido en cuenta las buenas prácticas identificadas en bibliotecas y otras organizaciones en esta materia. A continuación se analiza y valora la presencia de estos indicadores en la página web de las bibliotecas pertenecientes al consorcio madrileño Madroño para conocer su grado de transparencia. La comparativa entre el nivel de transparencia de algunas bibliotecas con el de sus respectivas universidades permite ver cierta relación entre ambas. Los resultados del análisis muestran que algunas bibliotecas pueden realizar mejoras significativas, fundamentalmente, en cuanto a visibilidad, actualidad de la información que ofrecen y, también, incorporando algunos contenidos relevantes para sus diferentes grupos de interés.

Palabras clave: transparencia; rendición de cuentas; bibliotecas universitarias españolas; indicadores; consorcio Madroño.

Introduction

From the beginning of the 2008 economic crisis, transparency and accountability in organizations and the free access to information have moved to the forefront of public discourse, becoming an ascendant idea in

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

organization culture.[1] Some institutions are making considerable efforts to promote transparency and accountability. An example of this in the international level is Transparency International; and in Spain we find the Compromiso y Tranparencia foundation, the Luis Vives Foundation and Lealtad Foundation. Moreover, the recent Transparency Act passed in Spain[2], entering into force in December 2014, though spurring controversy and criticism because of its limited scope; nonetheless attempts to guarantee the public's right of access to public information. The act requires those entities within its purview, including public university, to publish information regarding its operations, the applicable standards for these operations and organizational structure, and the instruments of planning and evaluation and degree to which these are met. In *Chapter II* of this Act, addressing active publicity, public administrators are required periodically to publish up to date relevant information in order to ensure the transparency of their activities. Specifically, Article 5 of the Act require the release of institutional, organizational and planning information, while information associated with finances, budgets and statistics is required under *Article 7.*

Transparency is a term that comprises accountability, trust and credibility, and its scope of applicability lies in evaluation, while also associated with ideas such as corporate social responsibility. The clarity of information and free access to the same are aspects associated with all of these. Transparency expresses an organization's duty to release information regarding the administration and results, while providing rationale for its actions. Such organizations, moreover, are accountable before all persons with which they interact and associated stakeholders. Transparency is part of a democratic system and arises from the concept of the right to know how and for what public monies are spent.

When an organization is voluntarily accountable it promote trust and credibility. This has direct repercussions in its reputation and public face. But the simple fact of accountability should not be construed as en end in itself: its purpose is as a means of achieving trust between leaders and managers and other who actively in the accountability processes, including workers and beneficiaries of an organization's services or actions. Despite the need to provide accountability, as of yet there has been no determination of the ideal quantity and quality of information organizations should be required to supply.

1 J. Cabrera, "La transparencia es clave para el futuro de nuestras organizaciones".
2 Ministry of the Presidency, Transparency Access to Public Information and Good Govern ment Act 19/2013 of December 9.

ICT and the Web 2.0 constitute a powerful tool in the communication of transparency and sharing of information. Moreover, these advance allow for interactive communication. The webpage assumes the existence of corporate identification of the organization of any and everyone who is associated with it and it also serve as a means of publicity. In this way it can become the main the main channel for providing accountability with regard to what it does things, how it does them and the results achieved.

In the area of non-profit organizations devoted to providing services to society using public money, these organizations are required to employ any revenue they generate to fulfill their stated missions. In this way transparency and accountability are assumed broadly. This is the view expressed in the report on transparency in non-profit organization released by the Observatorio del Tercer Sector (the Third Sector Observatory) (OTS), which sees transparency and accountability as inherent to their mission and values. The accountability of non-profit organizations entails financial and legal matter with regard to compliance, stating: "being accountable to society of the impact or its actions and activities and how these help improve society, including its commitment to its mission, i.e., why they perform some activities and not others.[3]

Several studies on transparency in certain Spanish institutions pretend to contribute to increasing the degree of transparency, identifying the relevant areas of information to be released to the public. The Compromiso y Transparencia foundation examined the degree of transparency in 50 universities in 2011 and 2012. The latter study included an examination of 25 private universities.[4] These studies rank the universities in term of transparency in accord with specific criteria. The reports of these studies provide recommendations to the university administrations about the institution information disseminated through their web pages, while also discussing the relevant contents of such information from the standpoint of accountability. Since university libraries are basic university services, to which "at least 5.0% of the ordinary universities budgets are allocated,"[5] it would not be unreasonable to suggest they should be more transparent. Moreover, such

3 Observatorio del Tercer Sector, Transparencia y rendición de cuentas en las organizaciones no lucrativas, 13

4 E. Barrio y J. Martin Cavanna, Examen de transparencia. Informe de transparencia en la web de las Universidades Públicas Españolas, y Examen de transparencia. Informe de transparen cia en la web de las Universidades Públicas Españolas 2012

5 Red Española de Bibliotecas Universitarias, Normas y directrices para bibliotecas universita rias y científicas, 62-63.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

transparency could be useful to solidifying and enhancing the university's good reputation. On the basis of this idea, this study aims to address the following the questions:

- What information should the university library make transparent?
- Do university libraries use their websites to provide transparency?
- Is there a relationship between the philosophy of transparency of the university and one of their basic services such as its library?

Transparency of university libraries

The evaluation of Spanish university libraries is in large degree a well-established operation, as evidenced in the professional literature and the number of libraries that have received professional library quality services awards on the basis of evaluations they undergo.[6] Moreover, in 1994 the Red de Bibliotecas Universitarias Españolas (REBIUN) (Spanish University Libraries Network) agreed to gather data associated with their activities. This that time one can consult predefined and custom statistical data and annual indicators. This allows anyone to consult and evaluate diverse aspect with the library's performance, effectiveness, quality and impact. This commitment is, in principle, an exercise linked to transparency of the Spanish university libraries.

The literature on transparency and accountability is associated with that on evaluation, in that both arise from a single process. Accountability and evaluation are needed for quality to be recognized and funding to be justified.[7] The antecedents, stages and progress in the field of evaluation of libraries have been sequenced by Heath, with an emphasis on the support that the American College and Research Libraries (ACRL) have been lending to all manner of activities associated with this topic.[8] With regard to management and administration, the Standards for Higher Learning Libraries states: "The library communicates assessment results to library stakeholders."[9] This statement alludes directly to the idea of accountability to anyone having anything to do with them. Even with evaluation and accountability, dissemination is

6 Nuria Balagué, "Consolidando la calidad en las bibliotecas universitarias: evaluaciones, sellos, diplomas y certificaciones".
7 J. M. Fluxá, "La rendición de cuentas y la evaluación son necesarias para que la calidad se reconozca y la financiación se justifique".
8 F. Heath, "Library assessment: the way we have grown".
9 American College and Research Libraries, Standards for Libraries in Higher Education.

sometimes lacking. It is not done at all or it is done only done in a cursory fashion. Moreover, just like in the business world, we have a lot of information data and indicators on libraries, but critical questions still need to be posed to envision a strategy and draw a trajectory for the future.

Library professionals have pointed to the need be accountable before the competition with other university services, and the information that it should provide: this is the case of St., Clair,[10] Osman and Bidin[11] and Smith.[12] Others have criticized the use made of all the data gathered by libraries when these only serve to demonstrate their value and provide accountability before the university administration, and are not designed and used to improve the organizational services and learning.[13]

In the Spain the topic of the transparency in libraries has drawn considerable interest for some time. In the 1990s Carmena proposed a decision making process for libraries based on memory-reports, and he set forth the guidelines to following for drafting them.[14] It has also been the focus of diverse events where documents such as "service letters" were presented in order to contribute, among other questions, to the administrative transparency of libraries.[15] As a result of the crisis, stress has been placed on the need for libraries to be accountable to the community regarding the best and most effective use of public their public budgets.[16]

Even though there is no legal normativity specifying the type of documents or information a library must exhibit, some regulation provide the duty to draft an annual service report or account.[17] This requirement supposes that the university library, responsible for the administration and exercise of a budget, must be accountable before the university with regard to how its budget is allocated, a habitual practice, on the other hand, among universities.

10 G. St. Clair, "Assessment in an Era of Accountability".
11 Z. Osman y S. Hanon Bidin, "Accountability in library management: issues and strategies for the 21st. Century".
12 Gregory A. Smith, Retooling the Profession: Librarianship in an Era of Accountability and Competition.
13 Meredith Farkas, "Accountability vs. Improvement: Seeking Balance in the Value of Academic Libraries Initiative".
14 Miguel A. Carmena Escribano, "Tomar decisiones en una biblioteca: algunas sugerencias sobre las posibles pautas a seguir en la elaboración de memorias-informes".
15 Julia García Maza, "Exigencia de transparencia vs. vocación de opacidad: función social de las cartas de servicios en las bibliotecas".
16 Cristóbal Pasadas Ureña, "Multialfabetización, aprendizaje a lo largo de la vida y bibliotecas".
17 Por ejemplo, el Reglamento del Servicio de Biblioteca de la Universidad Autónoma de Barcelona.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

Third Strategic Plan, which includes an objective devoted to the coordination of the memoirs of actions, statistics and indicators as a model of transparency and tool for quality management.

Objectives and methodologies

This paper has two objectives. The first aims to determine what information that should be exhibited by the library for the purpose of transparency, taking in to account the best transparency practices for libraries and other organizations. A proposal of the indicators linked to the relevant areas is presented, and examples of these indicators in several libraries are also examined. An indicator is a unit of information (document, datum or symbol) that shows or indicates the transparency goals of the area.

The second objective, applied to the proposal made, is to learn the degree of transparency of the university libraries belonging to the Madroño consortium by examining their webpages. To this end, the presence of established indicators is analyzed. This will serve also to see if it is possible to link the transparency shown on the university web and that of its library. This examinations starts with the hypothesis that the philosophy and culture of transparency of the first must influence and be seconded by the latter.

This paper is modeled on the work of Barrio and Cavanna[18] on transparency in Spanish universities. Following the methodology used in their two paper son the subject, we first selected a group of libraries to study, and then we identified the most relevant areas for accountability in accord with the mission and function of the university library. We proceeded to select the contents or basic units of information (indicators) corresponding to each of the areas selected, taking into account several examples observed in university libraries. After establishing these indicators, we ascertained their presence in each of the web pages of the seven member university libraries of the Madroño consortium under study. This group was taken because they are public university libraries in Madrid of diverse sizes, with varied number of

18 E. Barrio y J. Martin Cavanna, Examen de transparencia. Informe de transparencia en la web de las Universidades Públicas Españolas y Examen de transparencia. Informe de transparencia en la web de las Universidades Públicas Españolas 2012.

users, distinct collections and different infrastructures, etc.[19] The search for indicators centered on the web pages since they are a major medium through which users access library resources and services and, more importantly, for accessing the type or information associated to the library administration.

In order to deem the information display on the library web pages as ideal, we took into account the four following criteria which are habitually used in the evaluation of web pages:[20]

- *Visibility.* The information is located in an easily visible place and the contents are recognizable. One does not have to take a long route to get there.
- *Accessibility.* Understood as the ability or ease with which one can get to the website, including factors that facilitate their use or availability. This is translated and used through any navigation device, while retaining clarity, search-ability and its interactive features.
- *Currency.* The information is up to date and verified through the date of actualization of documents. The required information must correspond to the year 2013 since this is the last year legally closed when this paper was written. Since the analysis was drafted in the May 2014 and the library memoirs corresponding to this year have not yet been published, we decided to take the year 2012 as current.
- *Language.* The information must be understandable to the person consulting. I must have, therefore, be written in Spanish of offer a translation option when it appear in a foreign language.

The areas of information relevant to transparency of the library

On the basis of the aforementioned study, we present the areas of information considered relevant with the indicators that a university library should provide on its web page in order to be transparent (*Table I*). And some representative examples of each one. This adaptation takes into account its peculiar nature, in view of the relevance for the stakeholders interested in this information: politicians, the university administrators and institutions or organizations that contribute to funding, beneficiaries of their services (real

19 After this paper was accepted for publication the library of Universidad Complutense de Madrid ceased being a member of the aforementioned consortium. This does not affect its inclusion in this study since at the time of this analysis it was a member in good standing.

20 Marina Jiménez Piano, "Evaluación de sedes web".

and potential users, professors and students, especially), their own workers, other libraries with which they work, suppliers or providers of resources and the general public.

Table I. Transparency indicators grouped by relevant informational areas

Informative Areas	Indicators
1. Purpose of service and objectives pursued	a) Definition of the mission
	b) Strategic plan
2. Government organs and operational rules	c) Members that make up the library commission
	d) Regulations
	e) Specific normativity of the operation of services
	f) Letter of duties and rights of users
3. Services offered	g) Letter of services
4. Information resources	h) Policy/collection management program
	i) Institutional open access policy
5. Personnel	j) Organogram
	k) Personnel directory
6. Results	l) Management indicators (balanced scorecard)
	m) Satisfaction surveys
	n) Annual service log of activities report
	o) Acknowledgements, awards and certifications
7. Financial information	p) Budget
	q) Public tenders and contracts
8. Memberships in networks and other collaborative relationships	r) Networks with which they work and cooperate

Purpose of library service and objectives pursued

The purpose or raison d'être of the service is materialized in its mission statement defined when any strategic planning process is addressed, together with the vision and values. This should be revised and modified as warranted from time to time in order to adapt it to the particularities of the environment. In any case, it must be aligned with the objectives of the university and orient itself toward the strategic commitment.[21] This should be posted openly on the web page with the corresponding date of adoption and revisions, as, for example, it is in the library of the Massachusetts Technology Institute (MIT).[22]

Having a strategic plan demonstrates that the library is oriented toward objectives, which entails persons in a project and communicates this, what it wants to do and how it pretends to do it.

21 W. Lougee, "The diffuse library revisited: aligning the library as strategic asset", 614.
22 MIT Libraries, date consulted: May 12, 2014, http://libraries.mit.edu/about/

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

The indicators linked to this area of information would be two:

a) Definition of the Mission
b) Strategic Plan (current)

Organs of governance and operation rules

This area seeks to learn about the organ in charge of developing lines of action of library policy, and its main operational rules. In Spanish universities, the library commission tends to be the collegial organ that participates in its planning and management. All of its officers (chairman, secretary, and representatives of teachers, admin workers, services workers and students should be duly identified by their participation in the decisions that affect the library. The examples of the Las Palmas[23] and Jaén[24] do this, the latter also allows access to the official minutes of meetings.

In terms of the rules that regulate the operation of the library, the fundamental provisions are expressed in the regulations gathering the provisions library personnel and users are required to observe. The specific complementary norms to the regulations are also considered insofar as these norms serve to regulate the operation of such services as lending, use of work rooms, and lending of laptops or tablets, etc.; documents available on the website that are often provided under a single link. Another document that is part of this area would be the letter of rights and duties of users, whose objective is that the user gain a clear and unequivocal understanding of their relationship with the library.

The indicators associated with this information parcel would be:

c) Members that integrate the commission of the library (or corresponding collegial organ)
d) Regulations
e) Specific normativity of the operation of services
f) Letter of duties and rights of the users

23 Organización, date consulted: May 12, 2014, http://biblioteca.ulpgc.es/conocenos_organizacion#organos_gobierno
24 Comisión de biblioteca, date consulted: May 12, 2014, http://www10.ujaen.es/conocenos/servicios-unidades/biblio/sobreelservicio/comision

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

Organs of governance and operation rules

This area seeks to learn about the organ in charge of developing lines of action of library policy, and its main operational rules. In Spanish universities, the library commission tends to be the collegial organ that participates in its planning and management. All of its officers (chairman, secretary, and representatives of teachers, admin workers, services workers and students should be duly identified by their participation in the decisions that affect the library. The examples of the Las Palmas[25] and Jaén[26] do this, the latter also allows access to the official minutes of meetings.

In terms of the rules that regulate the operation of the library, the fundamental provisions are expressed in the regulations gathering the provisions library personnel and users are required to observe. The specific complementary norms to the regulations are also considered insofar as these norms serve to regulate the operation of such services as lending, use of work rooms, and lending of laptops or tablets, etc.; documents available on the website that are often provided under a single link. Another document that is part of this area would be the letter of rights and duties of users, whose objective is that the user gain a clear and unequivocal understanding of their relationship with the library.

Range of services offered

If one speaks of transparency, in addition to showing the list of services offered to users, the library should: "inform about concomitant rights and duties associated with such services," as established in Royal Decree 951/2005 issued by the Ministry of Public Administration of Spain, which establishes the general framework for improving the general Administration of the State. In this sense, the most complete informative document and indicator linked to this information on the range of services provided, and which reinforces the principles of transparency before stakeholders, is

g) The letter of services

25 Organización, date consulted: May 12, 2014, http://biblioteca.ulpgc.es/conocenos_organizacion#organos_gobierno

26 Comisión de biblioteca, date consulted: May 12, 2014, http://www10.ujaen.es/conocenos/servicios-unidades/biblio/sobreelservicio/comision

Best practices in the field of quality evaluation of Spanish university libraries show that many have a letter of services. In this way they exhibit the range of services provided, the quality commitments they acquire with regard to these services and the systems or mechanisms users can use to communicate with the library (complaints and suggestions, for example), in addition to the unit of measurement or indicators that serve to verify the degree of compliance with these commitments.

Information recourses

The library collection is an indispensable resource sustaining most library services, while also the largest area in which the annual budget is spent. The development of collections must be transparent, and the policies guiding collection development must be made public.[27] The tool or indicator that help guide the proper collection development and management, and serves to inform proper budget allocation on the basis of genuine priorities and objective of the linked to the collection, the user and institution is:

h) The collection management policy or program

It serves to communicate to the user the priorities and policies in all matters associated with the collection. Among other things, it shows the procedures associated with acquisition of material and its integration in a coherent collection, as well as its control and maintenance, including weeding and purging as warranted.[28] With regard to content, proposals are still being made to adapt it to the new current procedures.[29] As an indicator linked to transparency, it should include a section in which provides the formula chosen to be used by the library in order to allocate the budget among its departments, faculties and other organizational units of the university as per its structure, and the criteria established that are applicable.

Since the university is one of the main producers of knowledge as a result of its research activities, it would have to demonstrate its commitment

27 Ministerio de Cultura, Pautas para establecer una política de colecciones en una biblioteca pública.

28 Aurora de Mesa Sánchez y Margarita Taladriz Más, "El concepto de colección y el programa para su gestión y desarrollo".

29 Holly Hibner, **Making a collection count: a holistic approach to library collection management,** 20-35.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 103-127

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

by providing dissemination and open access to this knowledge in the form of an institutional policy. But is the library that manages the lion's share of the materials produced by university research through the institutional repositories, while performing those tasks associated with archiving and dissemination. For this reason, another indicator of transparency in this area would be:

i) The institutional open access policy regarding research results

Personnel

The capacity to contact the personnel providing services in the public administration is a trait of proximity with the citizenry that without a doubt contributes to better relations between both parties. Like other institutions, many libraries reveal their organizational structure, the relationship and dependencies between the units and the functions of personnel, in addition to facilitating the contact. To this end, the make a series of tools available to users. These tools can serve as indicators of transparency in this section:

j) Organogram
k) Directory of personnel

A good example of an organogram is that used by the library of Ohio. This organogram is a vertical type and includes complementary information and relationships among the dependencies it shows, in additional to various pages associated with its structure.[30] With regard to the directory, the library of Harvard University offers the possibility to search by thematic areas, library, librarian name, language and faculties or school,[31] in addition to showing the complete information of each library. Another useful model for presenting their specialist librarians is offered by MIT under the link "Ask the expert."[32]

Results

To refer to results assumes alluding to evaluation and performance. Every once and in a while new modifications and new alternatives arise, in addition

30 Organizational Chart Ohio Library, date consulted: May 12 , 2014, http://www.docstoc.com/docs/49249554/The-Ohio-State-University-Libraries-Organizational-Chart; University Libraries Committee Structure, date consulted: May 12, 2014, http://library.osu.edu/about/osul-committees/university-libraries-committee-structure/
31 Staff Library, date consulted: May 16, 2014, http://lib.harvard.edu/staff-directory
32 Ask the Expert, date consulted: May 16, 2014, http://libraries.mit.edu

to proposals insofar as methods and techniques for measuring the results of libraries.[33] The International Standard Organisation (ISO), has tried over the course of three editions to promote the use of performance indicators and normalize the gathering of information needed for calculation of these indicators.[34]

Spanish university libraries have established the statistical data and annual indicators that they gather to evaluate their performance and available on the REBIUN webpage.[35] This paper aims to verify whether the use of some of these indicators for its management control, given that this tool has been linked of diverse occasions with transparency in public administration.[36] By means of this periodic report, which prioritizes the synthesis and the relevance without attempting to be exhaustive, one can track the objectives that should align with the organizational strategies,[37] whether in its French group (Tableau de Bord) or American version (Balanced Scorecard). Associations such as the ACRL[38] have promoted its use and there are libraries that have used it for many years.[39] In Spain, la Pompeu Fabra has posted it on its webpage since the late 1990s;[40] also Carlos III, which adopted it in 2003 for the control and tracking of its service management.[41]

In view of the diverse information associated with the results of a library, the indicators linked to the same have centered on three aspects:

l) Balanced scorecard
m) Results of the user satisfaction surveys
n) The yearly annual memory or activity report

33 P. Brophy, Measuring library performance: principles and techniques.

34 Véase el trabajo Nuevos instrumentos para la evaluación de bibliotecas: la normativa inter nacional ISO sobre la tercera y última ISO 11620:2014, coordinado por Marta de la Mano González.

35 Indicadores REBIUN, date consulted: May 16, 2014, http://estadisticas.rebiun.org/cuestion arios/indicadores/indicadores_main.asp#

36 Por ejemplo, Carlos Vivas Urrieta, El Cuadro de Mando Integral en el sector público local: el caso del Ayuntamiento de San Cugat del Vallés.

37 José Bisbe y Viñas, "Criterios y herramientas para el control de la gestión a entidades no lucrativas", 148.

38 American College and Research Libraries, Library Assessment Conference: Building Effective, Sustainable, Practical Assessment.

39 Balanced Scorecard, date consulted: May 20, 2014, http://www2.lib.virginia.edu/bsc/metrics/index.html

40 Indicadors, date consulted:: May 20, 2014, http://www.upf.edu/bibtic/es/coneixer/indicadors/

41 Teresa Malo de Molina, "El Cuadro de Mando Integral, una herramienta para visualizar la estrategia en la biblioteca" 56. [The Balanced scorecard, a tool for visualizign library strategy].

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 103-127

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

Like other organizations, libraries habitually draft an annual memoir in which they report the activities performed during the year in terms of a balance. If it is complete, it can contain information associated with all aspect regarding performance: statistics on the use of services; indicators, user satisfaction survey results; degree of compliance with strategic plan objectives; cooperation projects; annual used figures; service hours; installations, etc., without forgetting financial information derived from the library's approved and exercised budget, showing itemized revenue, outlays, investments and allocation of resources. All of this information is structured and presented in accord with diverse criteria in accord with the library in question.

In the area linked to results, one must also keep in mind the information linked to qualitative aspects that show "how libraries do things." As such, indicators that evidence the quality of services, processes and activities would be:

o) Acknowledgments, awards and/or certifications received

Financial information

This information is the most closely associated with accountability. This is why there is a strong economic connotation that is fundamentally linked with:

p) The budget administered and the data regarding how it is exercised

Those in charge of libraries, such as public collection managers, exhibit professionalism by at year's end reporting and justifying the financial management performed during the year, including by information associated with the budget assigned and exercised, and itemizing revenue and outlays. Even though it is common for this to be included in annual reports, there are notable differences in terms of the degree of detail provided, for example, information regarding personnel. Since, this is often an expense not exercised by the library, except for salaries paid to student interns (included in Chapter IV), many libraries do not offer information regarding this matter. As such, one must examine other sources to find such information, such as, the university memoir of the REBIUN of data and indicators. Libraries such as Rioja[42] and Las Palmas[43] do report it.

42 Memoria de la biblioteca 2013, date consulted: May 20, 2014, http://biblioteca.unirioja.es/documentos/burmen13.pdf
43 Memoria informe 2012, date consulted: May 20, 2014, https://biblioteca.ulpgc.es/files/repositorio_de_docum152/memorias/bu/memoria_2012.pdf

If the library has alternate sources of funding, other than the university allocation, it would behoove it to report the name of the contributing companies or institutions, the financial backing and public funding secured and the amounts. The library of Yale University is an example of this.[44]

Other indicators of transparency associated with this area linked to financial information would be:

q) Procurement and public tenders

In Spain, all public organizations and institutions are required to issue public tenders and publicize the contracts with suppliers that surpass a certain value pursuant to the basic legislation governing public procurement. Libraries also have to issue public tenders for the subscriptions to journals and other publications, regardless of support, and of contracts it enters into for information access to specialized data bases and other electronic resources when these surpass a value of € 200.000,00. Generally, universities have a webpage where the public can consult the "supplier profile."[45] This webpage also publishes contracts awarded, including contracts awarded by the university library, and other data and information associated with contracts pursuant to the Public Sector Contract Act. The Transparency Act also addresses this aspect under Article 8, 1a, and specifies that this information shale b released and shall include the terms of the contract, the value of the contract, the participating bidders and the identity of the company awarded the contract.

The library of the Universidad de Barcelona, for example, posts its contracts and public tenders on its web page, including contracts with information suppliers. This page also shows public tender invitations, objectives, deadlines and awards.[46] The British Library provides a good example of transparency, using an institutional webpage to post detailed information of payments to suppliers above £ 25.000. This data is updated on a monthly basis.[47]

44 Yale University Library. Annual Report 2012-13, date consulted: May 20, 2014, http://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=1006&context=yul_annual-reports#page=2

45 Perfil del contratante, date consulted: May 20, 2014, http://www.uc3m.es/portal/page/portal/perfil_contratante

46 Licitacions i concursos, date consulted: May 14, 2014, http://crai.ub.edu/ca/coneix-el-crai/crai-unitats/unitat-administracio/licitacions-concursos

47 Transparency: Financial Transactions over £25,000, May 14, 2014, http://www.bl.uk/aboutus/foi/transparency/transactionsover25k/transactionsindex.html

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

Membership in networks and other collaborative relationships

Working in a network and being a member of second level organization implies transparency and accountability before the other members. What is more, these memberships entail costs and membership fees in order to have the right to enjoy the benefits they offer. As such, another indicator of transparency would be to release and report about:

r) The networks with which the library works and cooperates

It is also a common practice in Spanish university library webpages to post the logos of the networks in which they work and cooperate, and the other institutions with which they have collaborative agreements. These post often include information regarding activities, objectives and services, etc.

Transparency in university libraries of the Madroño consortium through its webpage

The information linked to transparency in libraries belonging to the Madroño consortium is available largely under links with diverse labels, such as About Us; Normativity and documents; Organization and Management; The Library; Get to Know Us; Learn More. A link on the main page titled Transparency was found that addresses this intention.

On the basis of information areas established in 18 indicators associated with the same, the analysis of seven libraries reveals the situation that appears in *Table II*, whose most outstanding features are discussed below:

- The values obtained in each library swing on a scale from 7 to 13 points (with 18 total point possible), which shows significant differences between them. The most transparent are the library of Alcalá, Carlos III and UNED, the latter with the same points.
- The indicators common to all libraries are the normativity on library use, the personnel directory and the mission, despite the fact that the latter is less visible because it is often located in the second or third

levels of other documents. Moreover, the mission also frequently appears without the date of adoption and modification. In some cases, the mission does statement does not fulfill the technical requirements for such statements.

- The indicators missing from the sample are those contained in the Balanced Scorecard and the public procurement contracts and tenders. Even though the use of management indicators is common to all of these, in no case are they linked to a pilot tool in the entire library based on the "synthesis" as required by the Balanced Scorecard. In the case of the Carlos III University, which has used it for this purpose,[48] the one corresponding to the year of analysis is not there.
- There are indicators present in a small number of libraries: the members of the Library Commission only in Alcala and with access to official acts; the Policy of Program for collection management (Carlos III and Complutense) and the Letter of User Rights and Duties (Carlos III and UNED); and the Institutional Open Access Policy, the current Strategic Plans, the Organogram (vertical only in the UNED and Alcalá, the latter the most complete in that it includes names and levels, and the results of satisfaction survey in three libraries.

48 Teresa Malo de Molina, "El Cuadro de Mando Integral…".

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 103-127

Table II. Transparency on the web of university libraries members of Madroño consortium (May 2014)

Informative Areas	Indicators	Libraries of Madroño consortium						
		Alcalá	Carlos III	UNED	Complutense	Politécnica	Autónoma	Rey Juan Carlos
Purpose and objectives	Mission	✓	✓	✓	✓	✓ *	✓	✓
	Strategic Plan	✓ (2012-14)*	✓ (2011-14)*	✓ (2012-15)*				
Organs and operational rules	Members of Library Commission	✓ *						
	Letter of user rights and duties		✓ *	✓				
	Library regulations	✓	✓	✓	✓		✓	✓
	Normativity governing use of services	✓	✓	✓	✓	✓	✓	✓
Range of services	Services letter	✓	✓	✓ *		✓		
Information resources	Policy/program for collection administration		✓ *		✓ *			
	Institutional open access policy	✓ *			✓ *	✓ *		
Personnel	Organogram	✓ *		✓ *	✓			
	Personnel Directory	✓	✓	✓	✓	✓	✓	✓
Results	Annual memoir	✓	✓	✓ (2012-13) *	✓		✓ (parcial)	✓ (parcial)
	Balanced Scorecard							
	Satisfaction surveys				✓ *	✓ *	✓ * (2013)	
	Awards, acknowledgments, certificates	✓	✓	✓			✓	✓
Financial information	Total budget	✓ *	✓	✓	✓ *	✓		
	Competitive bid contracts							
Membership in networks and collaborative relationships	Networks with which they work or cooperate	✓	✓	✓	✓	✓	✓	✓
Total	18	13	12	12	11	8	8	7

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 103-127

Correspondence between transparency of universities and their respective libraries

In the latest transparency ranking of Spanish universities serving as the objects of this study, those belonging to the Madroño consortium have a score assigned as a function of the number of the 25 indicators defined herein appearing on their respective university webpages. All of the universities fall within a range of 3 to 24. The universities based in Madrid fall in a range of 11 to 21, as can be seen in the columns in *Figure 1.* In order determine if there is a parallel between transparency of universities and their respective universities, taking into account 18 indicators established herein for the latter, a value of 1 is also assigned if the indicators appears on its webpage. Thus we obtain the values shown in columns on the right in Figure 1, falling in an interval of 7 to 13. In order to use the ranking of universities to establish comparisons, the library transparency values have not been weighted. If a given causal factor is weights (for example, when there are certain indicators in at least three libraries, which is the case of the Collection Administration Policy, the Strategic policy or the Institutional Open Access Policy, the situation of the first three places would be reinforced.

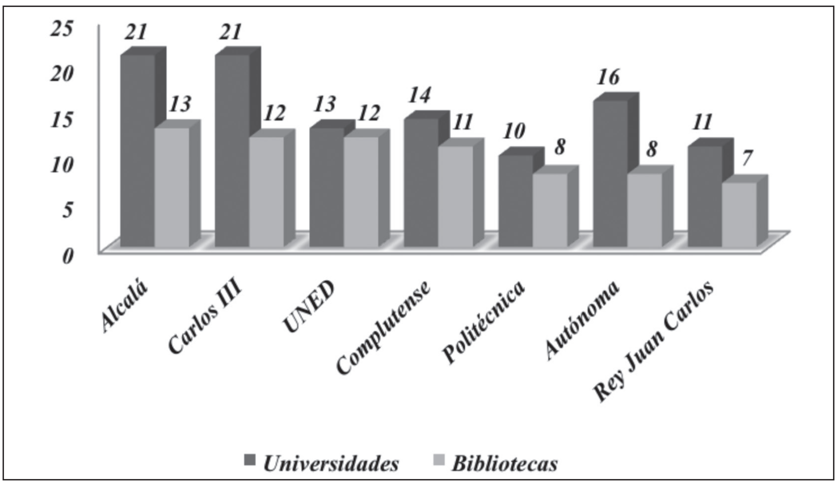


Figure 1. Comparative ranking of university-library transparency

A comparison of the values and the ranking of universities to their respective libraries reveals the following:

- The two university libraries (Alcalá and Carlos III) topping the transparency ranking are based in Madrid.
- In the remainder of the sample under study, there appears to be a certain affinity between universities and their respective libraries, though in one case there is a clear split. The university in second place in the ranking (Autonoma) does not correspond to the place held by the library. But the library in last place belongs to one of the lowest ranked universities. One can safely assert that the culture of transparency of the university is reflected in its library, though in one case this was not entirely true.

Conclusions

The presence of the established transparency indicators on the webpages of this group of Madrid-based libraries allows us to draw the following conclusions:

- All of these libraries publish information that justifies their administration and organization; however, there are relevant differences between these with regard to visibility, updating, and release of finished contents. All of the libraries under study have room for improvement in this area.
- The dispersion of documents associated to established indicators in many links and levels does not facilitate visibility in several cases; in other cases, the size of the font is too small and contrast is low, which in conjunction to the saturation of contents has negative repercussions on accessibility.
- Currency of information is also lacking in some cases, especially with regard to strategic plans that were enacted without genuine follow through to the present, as well as with regard to annual memoirs or reports which often lag behind.
- The contents most frequently appearing have to do with normativity governing the use of services, and the information associated with their placement and contact with professional working there.
- The areas requiring improvement have to do with information resources. Both the collection policy or program and matters of open access are infrequently represented in the sample.
- The indicators linked to results should be improved in some libraries. The budget should be reliable, understandable and provided in detailed. It is important to know the total cost of a service that is included under the heading of outlays for personnel.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

- Even though some exhibit useful section because they summarize in an orderly way the most significant data of the library (budget, visitors, users, collections, etc.), several require further explanation. The statistical data or indicators are not always understandable. In this sense, the annual memoir or report contributes to clarifying in a convenient way all of the data adding value to the figures.
- A key point to be stressed is the budget devoted to information resources, highly detailed and differentiated by type: monographs, journals, electronic resources (the latter sometimes by hiring modality), etc.
- Even though university libraries have agreed to a set of indicators which allow comparisons (available in REBIUN), this does not relieve the need of each of library to have and exhibit the group of relevant indicators linked to their respective strategies. In this sense, in addition to aiding administrative control, the use of the Balanced Scorecard, allows one to see the key areas of results of the library.
- One can infer the existence of a relationship between the culture of transparency of the university and the library, if one takes into account the correspondence between highly ranked universities and highly ranked libraries.

References

ACRL (American College and Research Libraries). *Library Assessment Conference: Building Effective, Sustainable, Practical Assessment*, Baltimore, Maryland, October 25-27, 2010. Fecha de consulta: 12 de enero de 2014, http://libraryassessment.org/archive/2010.shtml

Standards for Libraries in Higher Education, 2011. Fecha de consulta: 13 de febrero de 2014, http://www.ala.org/acrl/standards/standardslibraries

Balagué, Nuria. "Consolidando la calidad en las bibliotecas universitarias: evaluaciones, sellos, diplomas y certificaciones", *El Profesional de la Información* 16 (4) (2007): 338-342.

Barrio, E. y J. Martin Cavanna. *Examen de transparencia. Informe de transparencia en la web de las Universidades Públicas Españolas*, Madrid: Fundación Compromiso y Transparencia, 2012. Fecha de consulta: 10 de enero de 2014, http://www.compromisoempresarial.com/wp-content/uploads/Universidades2012.pdf

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 103-127

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

— y J. Martin Cavanna. *Examen de transparencia. Informe de transparencia en la web de las Universidades Públicas Españolas 2012*, Madrid: Fundación Compromiso y Transparencia, 2013. Fecha de consulta: 10 de enero de 2014, http://www.compromisoytransparencia.com/upload/32/56/InformeUniversidad2012.pdf

Bisbe y Viñas, J. (1993), "Criterios y herramientas para el control de la gestión a entidades no lucrativas", *Bibliotecas y servicios culturales en el ámbito municipal* (Alcúdia, 18-20 de noviembre de 1992), 133-154. Alcúdia (Mallorca): Fundació Biblioteca d'Alcúdia.

Brophy, P. *Measuring library performance: principles and techniques,* London: Facet, 2006.

Cabrera, J. "La transparencia es clave para el futuro de nuestras organizaciones", *Innovación en la gestión,* 2008. Fecha de consulta: 10 de enero de 2014, http://blog.cabreramc.com/2008/10/09/la-trans
parencia-es-clave-para-el-futuro-de-nuestras-organizaciones/

Carmena Escribano, Miguel A. "Tomar decisiones en una biblioteca: algunas sugerencias sobre las posibles pautas a seguir en la elaboración de memorias-informes", *Boletín de la Asociación Andaluza de Bibliotecarios* 33 (1993): 25-40.

Farkas, Meredith "Accountability vs. Improvement: Seeking Balance in the Value of Academic Libraries Initiative", *OLA Quarterly, Measuring Succes* 19 (1) (2013): 4-7.

Fluxá, J. M. "La rendición de cuentas y la evaluación son necesarias para que la calidad se reconozca y la financiación se justifique", *La cuestión universitaria. Boletín electrónico de la cátedra UNESCO de gestión y política universitaria* 3 (2007). Fecha de consulta: 19 de enero de 2014, http://www.lacuestionuniversitaria.upm.es/web/grafica/videos/j_fluxa.pdf

García Maza, Julia. "Exigencia de transparencia vs. vocación de opacidad: función social de las cartas de servicios en las bibliotecas", 109-118, en *Actas 8 Jornadas españolas de documentación*, FESABID, 2003.

Heath, F. "Library assessment: the way we have grown", en *Library Quarterly* 81 (1) (2011): 7-25.

Hibner, Holly. *Making a collection count: a holistic approach to library collection management.* Oxford: Chandos, 2010.

Jiménez Piano, Marina. "Evaluación de sedes web", *Revista Española de Documentación Científica* 24 (4) (2001): 405-432. Fecha de consulta: 11 de enero de 2014, http://redc.revistas.csic.es/index.php/redc/article/view/69/130

Lougee, W. "The diffuse library revisited: aligning the library as strategic asset", *Library Hi Tech* 27 (4) (2009): 610-623.

Malo de Molina, Teresa. "El Cuadro de Mando Integral, una herramienta para visualizar la estrategia en la biblioteca", *XII Jornadas Españolas de Documentación FESABID´13* (24-25 de mayo de 2013), 2013. Fecha de consulta: 23 de febrero de 2014, http://fesabid.org/documentos/fesabid13-actas.pdf

Mano González, Marta. de la (coord.), *Nuevos instrumentos para la evaluación de bibliotecas: la normativa internacional ISO*, Madrid: aenor, 2014.

Mesa Sánchez, Aurora de y Margarita Taladriz Más. "El concepto de colección y el programa para su gestión y desarrollo", *De libros y bibliotecas. Homenaje a Rocío Caracuel*, 233-241. Sevilla: Universidad, 1995.

Ministerio de la Presidencia. *Ley 19/2013 de 9 de diciembre, de Transparencia, Acceso a la Información Pública y Buen Gobierno* (BOE, 10 de diciembre de 2013), 2013. Fecha de consulta: 11 de enero de 2014, https://www.boe.es/boe/dias/2013/12/10/pdfs/BOE-A-2013-12887.pdf

Ministerio de Cultura. *Pautas para establecer una política de colecciones en una biblioteca pública,* 2009. Fecha de consulta: 22 de enero de 2014, http://www.mcu.es/bibliotecas/docs/MC/ConsejoCb/GruposTrabajo/GT_Seleccion_BP/09_Pautas_para_establecer_una
_politica_de_colecciones_en_una_biblioteca_publica.pdf

OTS (Observatorio del Tercer Sector). *Transparencia y rendición de cuentas en las organizaciones no lucrativas,* Barcelona: OTS, 2007. Fecha de consulta: 23 de enero de 2014, http://www.lasociedadcivil.org/docs/ciberteca/200710_transparencia_ots_v44_copy.pdf

Osman, Z. y S. Hanon Bidin. "Accountability in library management: issues and strategies for the 21 st. Century", en *Internacional Seminar Challenges of Libraries in the 21 st. Century* (29-31 March. Manila, Philippines), 2004. Fecha de consulta: 13 de enero de 2004, http://asiapacific-odl2.oum.edu.my/C33/F219.pdf

Pasadas Ureña, Cristóbal. "Multialfabetización, aprendizaje a lo largo de la vida y bibliotecas", *Boletín de la Asociación Andaluza de Bibliotecarios*, 98-99 (2010): 11-38.

REBIUN (Red Española de Bibliotecas Universitarias). *Normas y directrices para bibliotecas universitarias y científicas*, Madrid: Ministerio de Cultura, 1999. Fecha de consulta: 23 de enero de 2014, http://bib.us.es/sobre_la_biblioteca/carta_servicios/normativa/common/
bibliotecas_universitarias_rebiun.pdf

Smith, Gregory A. *Retooling the Profession: Librarianship in an Era of Accountability and Competition*, Faculty Publications and Presentations, Paper 47, 2009. Fecha de consulta: 14 de febrero de 2014, http://digitalcommons.liberty.edu/lib_fac_pubs/47

St. Clair, G. "Assessment in an Era of Accountability", *Journal of Academic Librarianship* 24 (3) (1998): 197-198.

UAB (Universidad Autónoma de Barcelona). *Reglamento del Servicio de Biblioteca,* 2003. Fecha de consulta: 24 de enero de 2014, http://www.uab.cat/servlet/Satellite/bibliotecas/normativas/reglamento-del-servicio-de-bibliotecas-1096482171114.html

Vivas Urrieta, Carlos. *El Cuadro de Mando Integral en el sector público local: el caso del Ayuntamiento de San Cugat del Vallés*, Madrid: Instituto Nacional de Administración Pública, 26 de junio de 2007. Fecha de consulta: 28 de junio de 2014, http://www.sfo.santcugat.cat/files/3-159454-annex/Doc02.pdf

Para citar este artículo:

Pacios, Ana R. 2016. "Universidades transparentes con bibliotecas transparentes." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 103-127. http://dx.doi.org/10.1016/j.ibbai.2016.10.006

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.006

Collections of musical documents. Rare books, special books?

Artemisa M. Reyes Gallegos*

Received:
July 29, 2014.
Accepted:
June 2, 2016.

Abstract

Music as sound performance, as creative idea and as a social phenomenon enter documentary archives under diverse categorical modalities. Music created in a performance or concert can be found in the record of sound and audiovisual representations or as graphic records such as a printed or hand-written musical score, whether old, modern or digital, as well as in diverse textual and graphic documents of music or texts referring to music. Music is expressed in an array of document types, including, books of manuscripts or printed materials; musical scores, and audio and audiovisual recordings. Regardless of format or support, a document provides a record of

* Universidad Nacional Autónoma de México; Orquesta Sinfónica del Instituto Politéctivo Nacional, México. artemis.rg@comunidad.unam.mx; areyesgal@ipn.mx

a particular environment, which may be academic, religious, commercial or artistic, while reflecting the development of the music, the technical skill of the composer, as well as development of technology. The record may be part of a collection that stands out in the memory of a people. This wide variety of documents and vast number of tangible musical objects constitute the representation or material vehicle of the intangible expression that is music, and as such shall require an interdisciplinary approach for both study and management.

Keywords: Music, musical documents, books, sheet music, ancient manuscripts, printed, incunabula, iconography.

Resumen

Los acervos de documentos musicales. ¿Libros raros, libros especiales?
Artemisa M. Reyes Gallegos

La música como interpretación sonora, como idea creativa y como fenómeno social ingresa a los acervos documentales bajo diversas modalidades. La podemos encontrar en el registro de representación sonora y audiovisual cuando se trata de una interpretación o concierto y como registro gráfico en la partitura, ya sea impresa o manuscrita, antigua, moderna o digital y en diversos documentos textuales y gráficos de música o referentes a ella.

Los tipos de documentos en que se plasma la música son librarios (manuscrito, impreso) o libro-música, entre ellos los de música notada, como las partituras, o de música programada, como los sonoros y audiovisuales. Independientemente de su formato y soporte, el documento testimonia un determinado entorno, que puede ser académico, religioso, comercial, artístico, que refleja el desarrollo de la música así como la destreza de la técnica de escritura manual e impresa o el desarrollo de la tecnología. Puede ser parte de un acervo que comprenda testimonios y trascienda en la memoria de la sociedad. La vasta variedad de documentos y objetos musicales tangibles constituyen la representación o vehículo material de

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

una expresión intangible, como lo es la música, que requiere de un trabajo interdisciplinario para su tratamiento y estudio.

Palabras clave: Música; Documentos musicales; Libros; Partituras; Manuscritos antiguos; Impresos; Incunables; Iconografía.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Introduction

The scientific, historical, comparative and systematic study of music corresponds to the field of musicology;[1] a field of knowledge whose aim is to carry out research in music as a physical, psychology, aesthetic and cultural phenomenon; it is also an approach to the human interaction with music in cultural diversity and musical styles, that is, the music as a cultural practice (Hitchcock y Deaville, s. f.).

For the analysis and research of the musical phenomenon, musicology utilizes a broad range of documents, sometimes classified as rare of special formats. The document is the tool and product in musical research, of which the most closely associated with music is sheet music, which has its own features in terms of its treatment in library science and Archivology. Additionally, for the examination of musical expression books on music, music periodicals and in general all literature referring to this subject area, both published and unpublished, and public and private, including books on music books.

Musical interpretation, whether instrumental and/or vocal and/or stage productions (concert, opera or ballet), is not permanent in space, since its support is memory of the spectator and the interpreter: it is an intangible

1 Musicologist Guido Adler breaks this down as: a) historical: devoted to the history of music; b) comparative: generically known as ethnomusicology; c) systematic: which includes acoustic, physiological, psychological, aesthetic, sociological, pedagogical and theoretic aspects of music. In practice is embraces. Criticism and subjects associated with the execution of musical in all eras.

expression that nowadays has a tangible technological support. Once sound and audio-visual expression is committed to a support, it becomes a cultural artifact, and as a document it can be treated as such.

The musical document as a conservation and dissemination resource of musical knowledge is an element of cultural intellectual heritage and written cultural testimony.

The retrospective study of its evolution verifies the indissoluble relationship with the function that music has performed in diverse societal contexts and cultural moments. In this light, we can appreciate the importance the management of our ancient, modern and digital musical heritage. Here we focus on the review of library musical documents and the sheet music, the field of the sound and audio-visual artifacts is so large that these shall be mentioned briefly in order to contextualize the universe of the musical document. A detailed analysis shall offered at a later date.

Music as document

From the standpoint of library science treatment, musical documents can be ascribed to diverse criteria. Thus, on the basis of the representation form in the physical support, the following can be cited:[2]

- Graphic: sheet music, journals, hand programs, librettos, etc.
- Iconographic: Photographs, paintings, prints, posters, picture books, sculptures, etc.
- Sound: cylinders, discs, reel tape, magnetic tape, etc.
- Audiovisual: films, videos, etc.
- Plastic: musical instruments, objects.
- Electronics: diskettes, optical digital disks, optical disks, optical read risks, etc.

The description of document, on the basis of the definition of the UNESCO, includes the following varieties: texts, non-texts (graphics), audiovisual

2 Musical example have been added to those noted by López Yepes (1995), cited by Rodríguez Bravo (2002: 75).

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

(including sound) and virtual. In musicology, the documental sources come in written form, as images, and sound and audiovisual forms. Of the written documents, manuscripts or print media, the major ones are sheet music, notes, books and journals; fixed images include prints, iconography (flat images, free standing sculpture and sculpture), photographs; among the moving picture documents, we find film, video, animation; sound documents include analogue and digital phonograms, and audiovisuals *(Table 1)*.

Table 1. Main types of musical document sources

• Written documents	– Manuscripts – Printed – Digital	– Scores – Notes – Books – Magazines – Librettos
• Images	– Fixed images	– Prints – Iconography – Photographs – Maps – Paintings – Slides
	– Motion pictures	– Silent films – Animations without sound
• Sound recordings	– Analogue – Digital	– Phonograms of musical – Phonograms of speaking – Phonograms of soundscapes
• Audiovisual Documents	– Combination of moving image and sound	– Cine – Videos – Animations – Multimedia – Television productions

Another definition, which has to do with the message transmission code (Rodríguez Bravo, 2002: 77) and to which musical documentation has been aggregated, is comprised of:

- Texts: with signs[3] of written languages and/or musical notation
- Graphic: stage sets, choreographies, evolutions, blueprints, diagrams, etc.

3 Any of the drawings representing sound [and caesuras] or any other indication regarding performance. (Moliner, 2002).

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

- Iconographic: paintings, prints, slides, photographs, etc.
- Sound or phonic: tapes, cylinders, reels, disks, cassettes, optical reading devices
- Audiovisual: film, videos, motion pictures
- Plastics or tri-dimensional: instruments or objects and musical accessories, generally exhibited in museums and expositions
- Informatics: optical supports to be used with computer or optical readers
- Multimedia: digital documents that combine several optical reading codes

The use of the term "document" to mean audio and audiovisual recording is a recent and growing development. This usage suggests a paper document or at the very least something tangible and visually readable. According to Archivology, audio-visual documents are those that convey information through image and/or sound, and they include three groups: still images, moving images with sound tracks (Arévalo, 1991). The term audiovisual is applied to "fixed and moving images on film and microfilm recordings of sound, slides, models and mechanical models, mural paintings cards and posters" (Unesco, 1984: art. II).

The Recommendation for the Safeguarding and Preservation of Moving Images of the UNESCO (1980: I.1.a) uses the term "moving image" to "any series of images recorded on a support […] with or without sound racks, which when projected give the impression of movement and are dedicated to communication or distribution among the public or are produced for the purpose of documentation."

Moreover, the Norma Mexicana de Catalogación (Mexican Cataloging Standard) (2008: 19) tells us that the sound or phonographic document is the "physical support on which the sound (music, human voice and others) is recorded by analogue or digital techniques, acknowledged as a cultural product that conveys knowledge, ideas, emotions and provide testimony of events."

Musical expression as a tangible document

A watershed in the study of musical interpretation came about at the end of the nineteenth century, when music recordings appeared in the field of music, which had always been temporary and ephemeral. Recordings allowed the ephemeral to be fixed in time and space, in that such recordings can be heard over and over again. Technology allows us to transform intangible expressions into tangible documents, from immaterial and fleeting manifestations into audio and audiovisual recordings audiovisuales on analogue or digital supports. Another type of printed documents is photography by which uses fixed image to show musical activity.

The study of musical interpretation –concerts and stage performances— has been made possible through reviews written by reviewers who attend these events. These writings employ description, narration, criticism and critical review. Another approach to understanding musical performance is found in the magazine archive hemerográfica, and of course in literary and iconographic allusions.

Musicology often relies on three-dimensional objects that can be considered documental sources, such as sculpture, architectural ornaments and craftworks. Another modality of musical documentation is the organológico study of ancient and traditional musical instruments and associated accessories.. Some of this information is found in instrument building manuals. This specialized bibliography includes blueprints, diagrams, photographs, etc. which support their study and production. These editions constitute documental sources for researchers. In the opposite direction, that is, when blueprints and diagrams are developed on the basis of the study of ancient instruments allowing replicas to be made that achieve sound quality nearly identical to the originals, the document is the instrument itself. *(Illustration 1).*

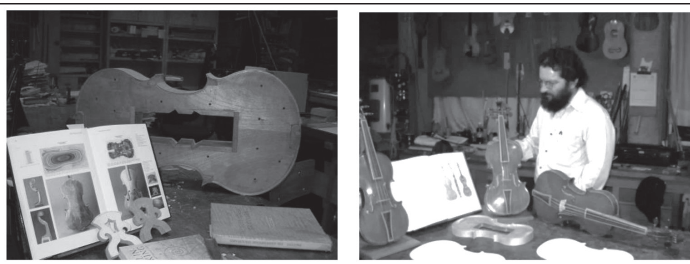


Ilustración 1. From the document to he instrument and from the instrument to he document. Organological documental sources.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

In order to refer to sound expressions, there are other silent musical artifacts, such as sheet music, treatises, studies, and written discourses on music, comprising and vast array of tangible musical heritage. Through analysis of the information these sources contain, we know about musical styles, public tastes and the social context of works, composers and interpreters. These textual and graphic artifacts held in archives, libraries or institutional, religious and private museums are objects of study and reflection in musicology.

Through the use of signs, graphemes, glosses, lines and images, musical archives preserve both recent and remote history, both individual and collective. These are artifacts of the past social codes, mores and conventions, telling us about the personal and social rights, practices and appreciations of earlier times. These artifacts corroborate past acts and dispositions, the development of institutions and organization, the life of persons, their underlying values, tastes, beliefs and convictions, as well as their habits and customs (WCCD, 1996: 228-229), while referring to the interactions of persons, communities and nature, and how people conceive of these interactions.

Because of the variety of Supports, formats, origins, and antiquity, musical documental sources are dispersed in a wide variety of public depositories, including universities, conservatories, sound libraries, media centers, radio and television stations, religious archives and museums. The materials held in private hands, moreover, is not less important. These personal and private collections are not often governed by the criteria of librarianship, and in some occasion they have musicological features.

Musical information distributed in collections of manuscripts, rare and ancient books or special formats can be organized by means of support and format –musical scores, books and periodicals or sound and audiovisual documents; by epoch, old, colonial, Novo-Hispanic, by century; by origin of creation: Mexican, European, etc.; by donor, acquisition or author. This can include monographs of a composer, an interpreter or an interpreter or personage, musical analyzes of a work, an era of music history, musical styles or genres, as well as glossed or critical editions, facsimiles of scores, publication of musicological or pedagogical research or proceedings of colloquiums, etc.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

The repositories of antique collections hold manuscripts and prints, engravings, cartographies and drawings. Those containing not so ancient materials, also photographs. Music and musician files include handwritten and printed scores, textual and graphic documents, even musical instruments and sound recordings with associated reproduction equipment. The new musicological tendencies have awakened awareness of the importance of interdisciplinary approaches and the advantages of new technologies. These kinds of archive and collections contain materials from a wide variety of disciplines.

Library musical documents in library holdings

The documentary collections are comprised of items of widely varied characteristics. A general classification based on the support and format divides them into librarian and non-librarian (Rodríguez Bravo, 2002: 77; Torres Mulas, 2000: 744); The first deals with "strictly to appearance and material, regardless of content [in which the book is] the set of pages of any handwritten or printed material joined together on one side" (Torres Mulas, 2000: 743). The Glosario de términos bibliotecarios (RDIB) (Glossary of Library Terms) defines a book as a "non-periodical printed or handwritten work consisting of many sheets of paper, parchment, vellum, or other material, sewn or bound together in a volume. Each one of the main parts in which the scientific or literary works are usually divided, and the codes and laws requiring extended discourses."

The Reglas de Catalogación Española (RC) (Spanish Cataloging Rules) define books as the physcial "set of sheets of any handwritten or printed material, and joined together on one side. When it consists of less than fifty pages, is called a booklet" (Directorate General of the Book, 1999: 584).[4] The National Council of Science and Technology (Conacyt) of Mexico defines it as a:

> printed work with date (year) and mention of a publisher recognized as such, usually in the first pages. It usually has more than 100 pages. [...] there may be opuscules, booklets or edited texts, smaller than a book [which in the absence of a

4 In order to provide complementary i nformation, we have consulted the Anglo/American Cataloguing Rules (AACR2) (Gorman y Winkler, 1999) and the Spanish Cataloging Rules (Dirección General del Libro, 1999).

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

category appropriate to this type of works are considered books by CONACYT]. Books published on CD with ISBN will be treated on the same level as printed books. (Conacyt, S. 25)

Librarian musical documents come in variants such as "textbooks" and "music books"; the latter, in the musical field, are called sheet music or scores. Non-librarian documents are audio and audiovisual recordings. Another classification serves to organize musical documents as printed or handwritten manuscripts and scores; programmed music (sound and audiovisual recordings), and personal and functional documentation. (Cabezas Bolaños, 2005: 88-89, Burgos Bordonau and Petrescu, 2011: 1-2). Other thinkers in these matters divide them into books, scores and sound recordings) (EUDOM, 2007: 15). The RC indicates them as printed manuscript music and recorded music.

Each of the musical documentary types has its own features either directly related to music or to the support of musicological study and research. In this study, we have chosen to distinguish these as written (or librarian documents) versus audio and audiovisual documents (or non-librarian documents).

Several types of librarian or written documents were found in the examination of diverse schools and authors. The category of books includes biographies of creators and interpreters, stories of musical activities of institutions, texts on theory, stylistic and technical analyses, historical essays, philosophical-musical dissertations, musical appreciation, compositional techniques, musical interpretation, evolution of instruments, etc. The EUDOM Classification (2007: 19-21) recognizes the headings shown in *Table 2*.

Tabla 2. Reference works

• Conference reports	• Almanacs-calendars
• Bibliographies	• Bio-bibliographies
• Catalogues	• Chronologies
• Dictionaries	• Ephemerides
• Encyclopedias	• Introductions and general writings on music
• Phonographies	• Iconographies
• Bibliographic indexes	• Topical indexes
• Lexicons	• Manuals
• Musicographies	• Treatises on musical documentation
• Musicales repertories	

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

The "books" that directly or indirectly contribute information to the knowledge of music in all its fields are known as peri-musical bibliography, these artefacts "refer conceptually to entities or activities linked to music" (Torres Mulas, 2000: 745), or because they allow information to be linked to the fields of thinking, knowing and making music. In a library, such works are classified by the subject matter they deal with (EUDOM, 2007: 13) *(Table 3)*:

Tabla 3. Library and peri-musical content

• Complement library	• Ethnomusicology
• General foundations of musicology	• History of music
• Musical instruments and their history	• Music and other sciences and arts
• Reference works	• Musical pedagogy
• Musical life – Musical commerce– Musical institutions	• Theory of music – Musical execution

Musical archives gather documental and musical collections handled in accord with their respective natures and volume. These can be divided into three types (Cabezas Bolaños, 2005: 88):

- The collections of musical works, gathered by interpreters or collectors.
- Collections that are the product of a natural and voluntary process of a natural or legal person, which reflect their musical and personal activities.
- A set of documents that enter in a disorderly and incoherent way and for which it is impossible to recreate its primitive organization, either because the collection is dispersed or because no such organization ever existed.

On the basis of this typology, Cabezas Bolaños (2005) proposes the following classification for the collection:

- Materials that are musical character: annotated music and programmed music.
- That of a personal nature: "very diverse documents, from memoirs, diaries, journals, correspondence [...] to documents pertaining to civil or ecclesiastical status such as baptismal, marriage or certificates, death certificates, sentences of divorce; [...] personal identification documents such as certificates, passports, academic transcripts, academic or professional qualifications, or health certificates, […] ordered numerically "(Cabezas Bolaños, 2005: 88).
- Functional materials generated in the exercise of a public or private function and not necessarily related to music. It is not recommended practice

to separate the documentation generated by single official. It is preferable to handle these in as a subset in chronological order. This is because the functional origin is the reason why the document is produced, which is directly related to the private and daily activities of a person.

The aforementioned documents are testaments to musical activity in the public, private, family, artistic, research, teaching and dissemination spheres. It is up to the researcher to determine the importance of each of these spheres in his approach. In the case of musical documents-scores, their historical use "evidences the existence of the musical work and its interpretation in the past; since both the score and the interpretation [and the recordings], there persists the concept of creation of the work itself "(Smiraglia, 2001: 3).

Pursuant to the means of conveyance of the message, documents are typified as follows (Rodríguez Bravo, 2002: 81):

- Textual. Information written by means of signs and graphics: books, periodicals, administrative documents, bibliographies, among others. These are read without need of any tools, devices or reading equipment
- Special. Essential information appears with particular, signs although it may include a portion of text. Of very variable structure in relation to the nature of its support. It can be seen, heard or manipulated. Among these types of documents are iconographic, plastic, sound and mixed-media artifacts, as well as audiovisual materials and products of informatics.

It should be noted that the Unesco 2000-2001 World Report on Culture, Cultural diversity, conflict and pluralism (Arizpe, 2001) included music in the area of culture. The statistics that accompany this publication place it together with cinema, television and sports. The statistics on publishing products present the book of music in the category of art book, on the same level of works on film, painting, photography or entertainment.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Antique documentos and manuscripts

The criteria of classification associated to dating that attend to the time of production, the writing process and the recording of writing enter into the label of "antique book," whether a manuscript or printed artifact.[5] So far no agreement has been reached regarding just how old and antique book must be, since each source determines the date. As such, the RC sets a date of 1801; the International Federation of Library Associations and Associations (IFLA) in its International Standard Bibliographic Description for Ancient Monographic Publications (ISBD (A)) [6] and the French bibliography establish the year 1820 as a limit, while the Consortium of European Research Libraries sets this limit at 1830.

Printed and manuscript works are treated similarly in questions of valuation and antiquity rating of antique books and antique book stores, erroneously employing such terms as antique book, rare book, priceless book and antique piece as synonyms (Pedraza García, 2004: 13). The antique book market often employs a cut off line at the first half of the nineteenth century. In general the term antique book refers to one produced in or before the first third of the nineteenth century (Tacón Clavaín, 2004: 2) and to books over 100 years old. (Pedraza García, 2004: 13). The manuscript book is one either written or copied by hand. Manuel Sánchez Mariana tells us:

> Even though there are manuscripts across all time periods up to today, we are necessarily referring to the time when manuscript production was most prolific. This is the long stage of history of humanity from the time of the oldest record of book production up until the second half of the fifteenth century, when in central Europe a procedure was developed to make multiple copies of books. The ancient world and the middle ages are the ages of the manuscript book (Sánchez Mariana, 1995: 7).

5 The manuscript book is not always considered an antique book or object of the Bibliography. This comes after the need to differentiate between handwritten, printed and digital documents, which has been accepted as bibliography material if is meets the age parameters (Reyes Gómez, 2003: 12).

6 ISBD(A). International Standard Bibliographic Description for Older Monographic Publications (Antiquarian).

The characteristic form of the book of the Middle Ages is the codex.[7] In music there are important studies on codices of scores. Another period in the elaboration of the manuscripts is that in which these artifacts coexist with printed books. In the specialized literature, this type of manuscript is called a Modern Age manuscript or modern manuscript. This meaning is derived from the invention of the printing press in 1435, in that all book artifacts before this time were hand-written or -copied. Among the definitions for cataloging manuscript in the AACR2 we find: "handwritten writings (including musical scores, maps, etc.) or typed text (typescript (s)); (689) and "lists of all kinds, including books, theses or dissertations, letters, speeches, etc., handwritten legal texts (including printed forms completed by hand) and collections of such manuscripts"(135). RC emphasizes that it is a "handwritten paper or book" or an "original or copy of a text intended to be printed, even if it is not handwritten" (585). Musical book production has followed a trajectory similar to that of general book production.

Music in handwritten and printed scores

Among the musical documents cataloged as book, we can distinguished manuscripts, printed materials and those specifically depicting musical script or notes, called sheet music, music paper or musical scores. Bibliographical definitions of the score refer to it as a document that "shows all the parts of a set designed to be heard at the same time, normally arranged one below another in different staves" (Iglesias Martínez and Ozano, 2008: 205) or the "Musical copy in which all the vocal and/or instrumental parts of a work are superimposed on a single page" (GTCCPB, 2010: 144). The sheet music used by an the

In musical ensembles -orchestral, vocal, and mixed pieces- the document with writing and musical notations corresponding to each of the members of the each voice or instrument is called part or partiella. Sheet music is shows the part played by a single player or singer "which contains everything that

7 In area of the history of the books it is accepted that use of parchment is linked to the form of the codex; the book develops from the papyrus roll to the binding of parchment. The codex lasted as the habitual form of the book into the third century, and it is the most common form of the book in the Middle Ages. (Sánchez Mariana, 1995: 8-9; Arévalo, 1991; McCleary, 1997; Moliner, 2002).

should be done [in the musical interpretation] alone or together" (Bañuelas, 2009: 105). It is the series of notes to be performed by a voice or instrument, either alone or in conjunction with other voices or instruments (Baker, Slominsky and Kuhn, 1995). Colloquially, both score and parts (or partiella) are generically identified as scores.

The feature of a score and a part is that the symbols used correspond to some system of musical notation: tablature, cipher, pneumatic notation, square, mensural, contemporary, alphabetic ciphers, etc., whose reading and interpretation allow the reproduction of the musical work (Cabezas Bolaños, 2005: 92, Torres Mulas, 2000: 746). The score is the medium that facilitates the writing of the creation and its consequent interpretation, because "insofar as the interpretation has not ocurred, the musical work is but a project that cannot be enjoyed" (Prieto Guijarro, 2011: 4). A musical document par excellence, the score graphically represents the musical conception of the composer and is a tool for the interpreter and source of knowledge for the musicologist.

The score is a record for the dissemination of the musical work; however, the presence of this in the field of interpretation, as a pattern of observance, is not a constant in the history of interpretation, as pointed out Colin Lawson (2011: 23-26):

> Ecclesiastical melodies were not written until the sixth century, and only in the twelfth century was a system designed to indicate the pitch of sounds, although not their exact value [... As such] one of the main difficulties in recreating the Medieval music is that improvisation and instrumental accompaniment are not shown in the notations that have come down to us.

Even today, with the evolution of musical notation systems, scores do not reflect the totality of the interpretive reality, because the performers contribute an important part of their personality to the work. The notation is still an approximation to the musical intention of the composer; nevertheless, it is the most representative document of the musical memory per se, as well as a fundamental element of knowledge and for musical interpretation, because if afforded proper conservation and treatment, it can be a stable, permanent object (Burgos Bordonau and Petrescu, 2011: 33); From the paleographic and diplomatic perspectives, the score is a tool of validation and authenticity over time.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

For the task of cataloging and, in general, bibliographical description of handwritten and printed musical notation, various specific designations are used because of their content and distribution, physical description, function and recipients (Appendix 1). In the same way, classification can be done by typology in the cataloging of library documents with musical notation (GTCCPB, 2010: 53-108). These matters are illustrated with specific musical examples:

- Scores (handwritten or printed): score, abbreviated score, script, study score, piano director part, violin director, etc., vocal score, reduction for piano, etc.
- Liturgical books that specifically contain the parts of the liturgy with music: *liber usualis*, Roman missal and gradual, hymnals, gospel, psalteries, etc.
- Musical, personal or institutional files, comprised of mostly notational music. These are comprised of a great variety of documents associated with the character and activity of the personage or institution.

The EUDOM systematic classification of scores considers musical and/or vocal training, solos and ensembles, instrument families, including mechanical and electronic instruments; presentation formats; collections by genres and types of collections; and by editions, anthologies and special supports.

It is important to consider that the same piece of music can be found in different versions and editions in scores with arrangements and transcriptions by several authors, in versions for piano only, for two pianos, for piano with four hands, for piano and other melodic and/or harmonic instrument(s), or for piano and voice or chorus, for band or for other instrumental ensembles. There may also be versions transcribed in different simplified shades and arrangements, etc., which should always be included in the catalogue separately (Brenne, 2004: 53-108). All of these versions are documentary sources for interpretation, teaching and research.

It is possible to find musical notation illustrating library documents catalogued as monographs; for example, in methods of study, in repertoires with extracts from symphonic musical passages, opera, etc.; songbooks and dance books, and that used to illustrate the texts of musical treatises or to complement critical studies. These can be useful examples for musical interpretation (GTCCPB, 2010: 5).

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Handwritten scores, the product of the practice prior to the invention of the printing press, are the musical support with the longest history, existing from their emergence as a mnemonic record until their elaboration as material for musical interpretation and diffusion. These score are found in mineral supports, parchment and paper, written with various spellings, symbols, tablature and systems of ancient and contemporary musical notation. Due to the changes in musical notation systems, the reading of the old scores is based on musical paleography[8] and in diplomatic knowledge in order to verify, among other things, authenticity, origin and workmanship. The appearance of printed music can be traced with the invention of the musical press.

In archives and libraries, scores are usually cataloged in the sections of practical music and theoretical and liturgical books and methods. When the library is not specialized or does not have a music section such books are placed in sections of manuscripts, miscellaneous manuscripts, incunabula or rare books.

The production of handwritten scores has continued to the present day, the conventions of handwritten notation by individuals have remained unchanged in the 21st century in musical writing. A great deal of the works must be disseminated to a handwritten copy and by photocopy, which is how we find them in many choral, orchestral and ensemble archives of all kinds and especially in personal collections. Since the end of the twentieth century, digital technology became available in the edition of music notation, which today emphasizes the daily reproduction of scores by means of photocopies and, more recently, by scanner and digital photography, highly favored options in musical practice, so much so that in many cases these can be found in private and orchestral collections.[9]

Factitious Collections

The link between the musical work and its sound interpretation is the score. The former is a project conceived by the composer that does not material-

8 The study of ancient musical notation systems and tablatures. Dom André Mocquereau introduced the term in the title of the first volume of the monumental work on singing music based on ancient manuscripts, Paléographie musicale (1889), published by the monks of the Solesmes Abbey in France. A terms used to identify the entire body of this publication.

9 Those of the symphony orchestras, chamber ensembles, choirs, bands and diverse classical, religious and popular groupings for the didactic, cultural, commercial and dissemination purposes.

ize until the latter occurs. The composer, the work and the interpreter are a reflection of a context, in that the works are somehow representations of the ideas, times, conceptions of their creators, and comprises the link between these the performers and the public, and the academy and researchers (Smiraglia, 2001: 2). As a source of knowledge, the score is a document that provides information "regarding the musical work, regardless of the possibility or not of listening" (Prieto Guijarro, 2011: 4). As a human product it belongs to a reality determined by the historical, social, intellectual, artistic, and labor circumstances in which the work was originally conceived. We can add to this the context of subsequent representations and interpretations, which modify the expressive meaning and sometimes even the dialectical intention, since the conditions in which the subsequent executions are made occur within reality (Brenne, 2004: 35) different from the one in which it was originally created, including the time in which it premieres and is first recorded.

Often musicians organize their scores into factitious collections. Facticia, accoridng to the Diccionario de uso del español (Dictionary of Spanish), is a word derived from the Latin facticus, meaning artificial or fabricated. The term is applied to things made or manufactured arbitrarily and not on the basis of the nature of the thing in question (Moliner, 2002). In documental terminology, it is applied to the copy that "contains diverse works that have been bound together. Aa single volume gathers unitary copies of diverse editions" (Clemente San Román, 2003: 254). In in general, the terms applies a volume of miscellany comprised of works composed on different paper supports, at different times, produced by diverse hands or manufacturers; and these could even have different measurements. In librarian vocabulary the collection is understood as a "volume comprised of heterogeneous pieces, whose being bound together is only justified on the basis of the conservation needs in a library or archive, not by a natural associations existing between them […] sometimes they form an organized musical repertoire of loose scores "(cited in Escalada, 2009: 2). It is also the gathering of documents of miscellaneous origin, which it owes to the researcher's desire (Arévalo, 1991). In the RC, we find that the factitious collection is a "volume that results from binding together published works independently." It is a set of graphic materials "made independently and later collected in one or several volumes, folders, etc." (General Direction of the Book, 1999: 571 / RC, 571), and is made up of documents that "have been produced independently and were kept separately until sometime after their production they are bound together" (GTCCPB, 2010: 12).

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

In the field of the music library, factitious collections are frequently found in institutional collections, ancient collections and personal collections and, perhaps, most common in the latter. The organization, imposed by the musician --professional, student or amateur-- responds to the needs of his activity or musical interests; therefore, “it is not always easy to find the thread that has led to the formation of a concrete collection, because interests vary” (Iglesias Martínez and Lozano, 2008: 46). Some artefacts are of interest to musicologists, and come in the form of notebooks, codices and object of critical editions. These notebooks are developed on the basis of different requirements or advantages, among which we can mention the following:[10]

- Collections for the student. Organized by level of difficulty, gender, and didactic function, etc. Frequently with dynamic and agogic accent, technical or expressive passages highlighted, interpretation advice and glosses.
- Collections for professional activity. They contain a useful repertoire for daily activity and are intended to facilitate transfer and management. These are found for an instrument and/or groups. Each notebook contains the *particellas* of a single instrument (or voice) and is complemented with the other notebooks.
- Sets of works for social and religious events such as dances, meetings, ceremonies, masses, etc.
- Sets of scores organized by collectors or fans, who compile works by a particular composer, of a specific genre or country, of a particular publisher or music created for an event.

The bindings of these volumes are in themselves object of study, because they provide information on owners, social context, tastes and customs of the time. It should be noted that publishers and booksellers also prepare factitious notebooks of a miscellaneous nature. These notebooks often attend to academic needs and interests, and matters of taste and popularity. In any case, these collection reveal the state of the diffusion and functions of music.

Cataloging of documental musical collections of each kind in archives and libraries for the backgrounds of each issue allows us to:

10 The typification is from Iglesias Martínez and Lozano (2008: 46), the description is by the author.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

> Understand a collection in terms of its origin, how it was gathered and its state of conservation, and to study the impact of legal norms on the formation and growth of the collection; while also promoting research using information on the dissemination of music and its commercial agents (publishers, booksellers) and [learn of] the professional uses of scores, [...] the handwritten annotations of property, as well as the arrangements noted on the stave, or their binding. (Iglesias Martínez and Lozano, 2008: 455-456)

Catalogues of antique musical documents, manuscripts, printed materials and incunabula

There are four international cooperative bibliographical documentation projects of in the field of musical research focused on cataloging of musical sources: Répertoire International des Sources Musicales (RISM), Répertoire International de Littérature Musicale (RILM), Répertoire International de la Presse Musicale (RIPM) and Répertoire International d'Iconographie Musicale (RIdIM), as well as companies devoted to the cataloging and classification of incunabula musical documents and facsimile editions.

Founded in 1952 and composed of working groups including Mexico, The Répertoire International des Sources Musicales (RISM) develops a multinational project to build a wide catalog of handwritten and printed primary musical sources that includes writtings about music and librettos held in libraries, archives, museums, monasteries, schools and private collections. RISM develops its activities under the auspices of professional associations such as the International Association of Music Libraries, Archives and Documentation Centers (IAML), the International Musicological Society (IMS) and the Council for Philosophy and Humanistic Studies (CIPSH), UNESCO and in coordination with The Bavarian State Libraries and its Virtual Library of Musicology (Munich), the library of Berlin, the Clori-archivo of the Italian Cantata and the Richard Strauss List of sources. Their publications -printed and online- created for the benefit of musicologists, musicians, librarians and antiquarian musicians, are divided into three series (RISM, 2015) *(Table 4)*.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Tabla 4. Publications of the Répertoire International des Sources Musicales (RISM)

Inventory of music sources	• Individual music documents printed between the 1600-1800 • Manuscript music made after 1600, including manuscripts, printed music, librettos and treatises
Bibliographies of materials organized by topic	• Collections of printed material from 16th to 18th centuries • Music theory from Carolingian Age up to 1500 • Manuscript Polyphonies from 11th to 16th centuries • Manuscript tropes and sequences • Print material on music (speculative, historical, esthetical or technical literature) • Tablatures manuscripts for lute and guitar • German hymns up to 1800 • Hebrew sources (musical notation up to 1840, writings on music in manuscript books and print material from the Genovese Age–7th century to 1040– to 1800 • Theory of music written in Arabic (900-1900) • Theory of ancient Greek music (1st to 17th century) • Theory of Persian music and manuscripts on music • Slave hymns (16th to 18th century) • Manuscripts on music and processional chants • Polyphonic Music in Ibero-American sources
Library directories of musical research	• Canada, United States of America • European countries • Italy • Australia, Israel, Japan, New Zealand • Czechoslovakia, Hungary, Poland, Yugoslavia

Iconography is an auxiliary discipline for the study of the history of music, past interpretive practices, social and cultural context, construction of musical instruments, as well as matters associated with dance, opera and theater. It provides support for the general history of art, literature, archeology, theology and cultural studies. Among the most important projects, Répertoire International d'Iconographie Musicale (RIdIM)[11] has been working since 1971 on the classification, cataloging and study of iconographic sources related to music. RIdIM is sponsored by IAML, IMS and the International Committee of Musical Instrument Museum Collections (CIMCIM) of the International Council of Museums (ICOM), which have cooperative agreements in place with RISM and RILM. This network aims to provide academic and professional support to interpreters, historians, librarians, lauders and stage designers, and producers of books and recordings. Since 1984 RIdIM has published "Imago Musicae" of the Librería Musicale Italiana and, since 2005, the RIdIM Newsletter. RIdIM (2015) highlights the following types of objects with iconographic material related to music *(Table 5)*:

11 Gathered since 2010 by the Institute of Musical Research de la School of Advanced Studies, University of London.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

Tabla 5. Types of object with iconography by the Répertoire International d'Iconographie Musicale (RIdIM)

decorative Arts	Collage	Drawings
Sculpture	Printed material	Musical instruments and objects
Jewelry	Toys	Books
Manuscripts, codices, scrolls, parchments	Water marks	Miniatures
Furniture	Mosaics	Murals
Numismatics	Photographic objects	Paintings
Textiles, costumes	Vases	Architectural features

There is a vast variety of musical documents —songs, tablatures— manuscripts and incunabula in circulation in the form of facsimiles in music and art books. Many examples of musical iconography are facsimiles. Facsimiles allow the study of authors and works from the primary sources. There are companies specialized in the classification, cataloging and description of facsimiles of musical documents from medieval to contemporary times, with catalogues of music and art providing bibliographical quotations and descriptions. These catalogues list rare and exhausted books, organized by composer, instruments and genre, drawing from compound sources and miscellanies, library of origin, selections of modern editions, monographs, memoirs and journals, which are often associated with the principal editors of facsimiles (OMI, 2004-2015) (*Table 6*).

Tabla 6. Editoriales de facsímiles musicales

Publisher	City	Country
Akademische Druck- und Verlagsanstalt	Graz	Austria
Alamire Publishers	Neerpelt	Belgian
Arnaldo Forni Editore	Bologna	Italy
Bärenreiter Facsimile Editions	Kassel	Germany
Beethoven-Haus Facsimile Editions	Bonn	Germany
Boethius-Severinus Press, Scolar Press, The English Lute Society	Guilford	England
Broude Brothers	New York	United States
Cornetto Verlag	Stuttgart, Baden–Wuntemberg	Germany
Éditions J.M. Fuzeau	Courlay	France
Éditions Minkof	Genera	Switzerland
G. Henle Verlang Music Facsimiles	Munich	Germany
Georg Olms Verlag, Hildesheim Facsimile Reprints	Leipzig	Germany
Institute of Mediaeval Music	Ottawa	Canadá
Laaber Verlag Facsimile Editions	Laaber, Ragensberg, Bavaria	Germany
LIM–Libreria Musicale Italiana	Lucca, Italia	
OMI Old Manuscripts & Incunabula	New York	United States

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Paléographie Musicale Facsimiles (L'Abbaye de Saint-Pierre de Solesmes)	Solesmes, Sarthe	France
Paul Sacher Stiftung - Paul Sacher Foundation Facsimile Editions	Basilea	Switzerland
Ricordi Facsimile Editions	Milán	Italy
SPES–Studio per Edizioni Scelte	Florencia	Italy

Otros organismos especializados en el estudio documental de la música son los siguientes:

- ISMIR. International Symposium on Music Information Retrieval
- IMC. International Music Council
- ICTM. Internacional Council for Tradicional Music (Consejo Internacional para la Música Tradicional)
- ICM. International Council of Music (Consejo Internacional de Música) (CIM)
- EUDOM. Euskalerriko Musika Liburutegein Elkartea (Asociación Vasca de Documentación Musical)
- CIM. Consejo Internacional de la Música (ICM)
- CEAA. Centro de Estudios de Archivos Audiovisuales
- CCAAA. Consejo de coordinación de las asociaciones de archivos audiovisuales
- ACIM. Association pour la coopération des professionnels de l'information musicale

The universe of music documents

If the collections of scores comprise a documentary universe. Because of their quantity and variety, documents on music are a colossal domain. In librarianship music documents comprise a wide variety of materials whose contents give information on the creation, interpretation, ideas, theory and practice of music with regard to teaching, research, diffusion and musical reflection. Moreover, these collections provide accounts of people, works, instruments, institutions and processes past and present of the world of music (Appendix 2). Valuable additional information is also found in the complement library, whose contents, even without direct relation to music, provide valuable insight.

Thanks to the collaboration of networks of musicologists and librarians in committees in 60 countries (including Mexico) that work in music publishing, the Répertoire International de Littérature Musicale (RILM) was created in 1964 and is now based in New York. The RILM is a bibliography with quotations, summaries and indexes of publications on different genres and types of music from 174 countries in 171 languages, with access to 800,000 entries.

In its repertoires, RILM includes articles, essay collections, facsimiles and re-prints, monographs, periodicals, conference proceedings, transcripts, sound and motion picture recordings, program notes, recordings, edits and commentaries, dissertations and degree theses, diagrams and blueprints of musical instruments and electronic resources (*Table 7*):

Tabla 7. Super classes of documents included in RILM

Anthologies	Western musical art
Western musical art	Jazz y blues
Imaginative literature	Reference and research materials
Liturgical and ritual music	Popular music
Traditional and non-western musical art	Music and related disciplines
Music and other arts	Pedagogy
Universal perspectives	Interpretive practice and notation
Sound recordings	Theory, analysis and composition

The following publications with information on the second third of the nineteenth century complement RILM's dissemination efforts: the RILM series Retrospective with current bibliographies, RILM Perspectives (series) with lecture reports sponsored by the RILM and RILM Abstracts of Music Literature (RILM, 2015).

Personal and private files

The field of music is also exemplified in posters and advertisements, hand and season programs, newspaper reviews, radio or television broadcasts, catalogues of instruments and scores; personal, official and fiscal correspondence; photographs, music editions, administrative documents, presentation and premiere albums; and institutional, business, family and personal documentation, all of which report:

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

> The place of the premiere, the sponsoring context (festivals, tributes, seasons, cycles, etc.), the existence of a commission by some person or entity, and the performers who take charge of that premiere [data] over successive interpretations of the work, [and references on] the dissemination of the work through the media, the names of the media and programs, as well as the date and time of issue, [and reviews of] print editions, sound and video recordings in the market, which cite the companies, dates and the common data often appearing in this type of products. (Prieto Guijarro, 2011: 12-13).

The variety of documentary elements in a personal archive, such as notes, references to a work, the life-line or particular interests of the owner, works for exhibition, teaching or editing materials, study programs, thematic compilations, contracts and inventories, offer details about personages, their work and thought, institutions context, and other relevant political, cultural, social facts. Other graphic materials in these files may include original and reproductions of two-dimensional art, diagrams, photographs, technical drawings, projectable material, three-dimensional artifacts, sculptures and models, cassettes, braille writing and other assorted works of art, exhibit materials, machines and costumes.

Music in books about books

In the study on documentary sources related to music, it is essential to include books on books: repertoires and catalogues which, for the interest of musicology, are found in the following varieties (Pedraza, 2004: 103-122) (*Table 8*):

Tabla 8. Books about books

Bibliographic Repertories	• General bibliographies of incunabula antique books • National typo-bibliographies • Bio-bibliographies • Topo-bibliographies • Specialized bibliographies • Repertory collections	
Catalogues	• Collective catalogues	– Collective catalogues of incunabula
	• Catalogues of libraries	– Catalogues of manuscripts – Catalogues of incunabula – Catalogues of books by period
	• Catalogues of libraries of bibliophiles	

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Repertories for booksellers and bibliophiles
Catalogues of antique booksellers and auctions
Print and online commercial catalogues

Other catalogs with information on subjects of musical interest are shown in *Table 9* (Escalada, 2009: 2; Iglesias Martínez and Lozano, 2008: 415-418).

Tabla 9. Catalogues containing information of musical interest

• Musical genre	• Publishers of print and digital music
• Sound recordings	• Publishers
• Instruments	• Librettos and scripts
• Directories of symphony orchestras	• Artistic agendas
• Songbooks	• Discographies

Periodicals and serials

Periodical and serial publications, both printed and digital (and online) are produced more agilely than the printed book, since its contents, divided into chapters, articles or sections often penned by different authors, offer advances in research, news, reviews, dissertations and reports that constitute an excellent means of up to date information. These serial and periodical publications, interesting in themselves and as reference works, include newspapers or journals, yearbooks, magazines, memoirs, minutes, etc., as well as numbered monographic series. They commonly bear titles such as yearbook, bulletin, circular, report, information, news, papers, magazine.

Founded in 1980, the *Répertoire International de la Presse Musicale* (RIPM) is an association of academics, musicologists, librarians and archivists from 20 countries. It is devoted to the indexation of literature and periodicals associated to music produced from the late eighteenth to the mid-twentieth century, including magazines specializing in music and musicology, theater and fashion. These catalogues also include engravings and lithography published in the illustrated press, pamphlets and newspapers, as well as articles published in literature magazines. The cataloguing of periodical and serials provides an important source for the detailed study of the history of music and musical activity from a contemporary musicology perspective.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

The RIPM retrospective index includes 223 indexed periodicals from 1760 to 1966 and is available in both printed (312 volumes 1988-2015) and online versions (since 2009). It currently registers 739,000 entries and is updated every six months. The RIPM is sponsored by IMS, IAML and ICPSH[12] of UNESCO and, since 2006, by the Centro Nacional de Investigación y Documentación e Información Musical "Carlos Chávez" ("Carlos Chávez" National Center for Research and Documentation and Musical Information). The Mexican periodicals included the RIPM are shown in Table 10 (RIPM, 2015).

Tabla 10. Mexican periodical in the Répertoire International de la Presse Musicale (RIPM)

Published	To be issued
Armonía (1866-1867)	
La Batuta (1874)	*El sonido* 13 (1924-1928)
Gaceta Musical (1928-1929)	*Revista Musical Mexicana* (1942-1946)
Música: Revista Mexicana (1930-1931)	*Nuestra Música* (1946-1953)
Cultura Musical (1936-1937)	

Conformation of musical collections

The works of a musical collection may include specifications such as repertoire of individual performer and musical ensemble, collection of works of a composer, private collector's library, archives and libraries of defunct entities. The catalogues distinguish three types of documents: a) musicological literature, aimed at specialists, musicologists and students; B) reference works, dictionaries, catalogues and encyclopedias, guides and yearbooks, and c) works intended for the general public, such as reissues in collections of titles of proven acceptance and new editions of works for musical dissemination.

The collections are made up of purchased materials, donations or loans, materials entrusted under custody agreements and political directives. Among the latter are the nineteenth century disentailment laws, which disposed of codices and musical works used in liturgical ceremonies, ordinaries and festivities that had been held in cathedrals, convents, monasteries and churches. The Ley de nacionalización de bienes eclesiásticos (Nationalization of Ecclesiastical Property Act of Mexico) of 1859 does not disclose the contents or subjects of the nationalized books and documents, and only mentions its entry into the "treasury of the nation," so that printed books

12 IMS. International Musicological Society; IAML. International Association of Music Libraryes Archives and Documentation Centres; ICPSH. International Council for Philosophy and Humanistic Studies.

and manuscripts, and other objects of the suppressed religious communities were allocated to museums, high schools, libraries and other depositories.

A large number of collections should be integrated and disseminated in order to rescue, rediscover and recover forgotten or lost archive from abandoned recesses of public, religious, educational and personal holdings. These materials are generally in poor conditions and require urgent specialized intervention to prevent their definitive loss. Another form of acquisition of funds is facilitated by laws of legal custodianship, which oblige the publisher and the author to deliver, generally to national libraries, a copy of the published work. Unfortunately there are large lacunae in these regulations with regard to sound and audiovisual documents.

Colophon

In the study of music, an activity intrinsically sonorous and ephemeral, not everything is sonorous and fleeting: there is a body of silent evidence that constitutes permanent witness to its existence and the perception of it across time and diverse latitudes. These silent witnesses are the scores, texts, treatises and a great variety of documents. The world of the book is not a rare book, but a special and inexhaustible source of inquiry for musicology, both in terms of content and in its support material, as well as for its value as documental evidence and in terms of the legacy it represents. The musical documents give an account of the commonplace and the extraordinary. They are historical memory of creation, innovation, interpretation, production, publication, distribution and understanding of music.

Each book acquires its own profile throughout its existence and holds a specific value in the eyes of the librarian, researcher, teacher or interpreter. This means these books will be appreciated for their different facets. The book can be treated as a historical, bibliographical, textual, typographic or editorial product of aesthetic activity or cultural expression. Musical collections are a universe that must be approached from different perspectives, specialties, functions and objectives. In order to place these works in their proper social, cultural, economic and environmental context, the treatment, management, study and dissemination of music collections requires professionals in documentation and information, as well as musicologists, interpreters, historians, music palaeographers and diplomats who deploy a trans-disciplinary approach informed an up-to-date vision.

References

Arévalo, Víctor Hugo. 1991. *Diccionario de términos archivísticos.* Asociación de Archiveros de Santa Fe. Fecha de consulta: 14 de julio de 2014, http://www.mundoarchivistico.com/?menu=diccionario

Arizpe, L., ed. 2001. *Informe Mundial sobre Cultura 2000-2001. Diversidad cultural, conflicto y pluralismo.* España: Unesco/Mundi-Prensa.

Baker, T., N. Slominsky y L. Kuhn, eds. 1995. *Schirmer pronouncing pocket manual of musical terms.* New York: Schirmer Trade Books.

Bañuelas, R. 2009. *Diccionario del cantante. Terminología clásica, vocal, musical y cultural.* México: Trillas.

Brenne, Marte. 2004. *Storage and retrieval of musical documents in a FRBR-based library catalogue - a comparison with the traditional databases in libraries today.* Oslo: Master thesis Oslo University College Faculty of journalism, library and information science.

Burgos Bordonau, E. y C. Petrescu. 2011. "Typology of the musical document: an approach to its study". *Bulletin of the Transilvania University of Brasov.* Series VIII. 4 (53) (2): 31-38. Fecha de consulta: 14 de julio de 2014, http://pendientedemigracion.ucm.es/centros/cont/descargas/documento39570.pdf

Cabezas Bolaños, Esteban. 2005. "La organización de archivos musicales. Marco conceptual". *Información, Cultura y Sociedad* (Universidad de Buenos Aires. Instituto de Investigaciones Bibliotecológicas) 13: 81-99. Fecha de consulta: 18 de septiembre de 2013, http://www.scielo.org.ar/pdf/ics/n13/n13a05.pdf

Clemente San Román, Yolanda. 2003. "Análisis, identificación y descripción analítica del libro antiguo. Las ediciones y sus variantes: emisiones y estados". En *El libro antiguo,* Manuel José Pedraza, Yolanda Clemente y Fermín de los Reyes, 249-266. Madrid: Síntesis: biblioteconomía y documentación.

Conacyt. S. f. *Manual. Curriculum Vitae Único.* México: Presidencia de la Repúblic, Conacyt.

COTENNDOC. 2008. *Norma Mexicana de Catalogación de documentos fonográficos NMX-R-002-SCFI-2007,* editada por el Comité Técnico de Normalización Nacional de Documentación. México: ILCE.

Dirección General del Libro. 1999. *Reglas de Catalogación. Edición nuevamente revisada.* Madrid: Ministerio de Educación y Cultura, Centro de Publicaciones, Boletín Oficial del Estado.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Escalada, Estela. 2009. "Particularidades en la descripción de partituras de la Biblioteca Nacional". *Experiencias en la organización y tratamiento de la información en las bibliotecas argentinas*, vol. I, 227-242. Fecha de consulta: 14 de julio de 2014, www.bn.gov.ar/descargas/catalogadores/ponencia_escalada.pdf

EUDOM (Asociación Vasca de Documentación Musical). 2007. *Musikako liburuen, partituren eta soinu-grabazioen sailkapen sistematikoa* [*Clasificación sistemática de libros de música, partituras y grabaciones sonoras*]. País Vasco, Vitoria-Gasteiz: Eusko Jaurlaritzaren Argitalpen Zerbitzu Nagusia [Servicio Central de Publicaciones del Gobierno Vasco]. (Bibliotekonomia, Colección Bilduma).

Glosario de términos bibliotecarios RDIB. S. f. http://www.bibliopos.es/recursos/enlaces/recursos-bibliotecarios1.htm#10 y http://www.rdib.net/glosario.htm#b (fecha de consulta: 28 de febrero de 2012).

Gorman, Michael y Paul Walter Winkler. 1999. *Reglas de Catalogación Angloamericanas (AACR2). Preparadas bajo la dirección del Joint Steering Committee for Revision of AACR, un comité de la American Library Association et al.* Traducido por Margarita Amaya de Heredia. Santa Fé de Bogotá: LTDA.

GTCCPB. 2010. *Manual de música notada.* Consejo de Cooperación Bibliotecaria Grupo de Trabajo de Catálogo Colectivo del Patrimonio Bibliográfico. Fecha de consulta: 14 de julio de 2014, http://travesia.mcu.es/portalnb/jspui/bitstream/10421/6041/1/MusicaMARC-jun2010conM.pdf

Hitchcock, H. Wiley y James Deaville. S. f. *Musicology. Grove Music Online. Oxford Music Online.* Oxford University Press. Fecha de consulta: 1 de mayo de 2015, http://www.oxfordmusiconline.com/subscriber/article/grove/music/A2242442

Iglesias Martínez, Nieves e Isabel Lozano. 2008. *La música del siglo XIX. Una herramienta para su descripción bibliográfica.* Madrid: Biblioteca Nacional de España. Ministerio de Cultura.

Lawson, C. 2011. "La interpretación a través de la historia", en *La interpretación musical,* J. Rink, 19-34. Madrid: Alianza Música.

McCleary, J. 1997. *Glosario de términos técnicos de conservación de libros y documentos. Inglés-español, español-inglés.* Madrid: Clan.

Moliner, M. 2002. *Diccionario de uso del español,* 2a. ed. Madrid: Gredos.

OMI (Old Manuscripts & Incunabula). S. f. Fecha de consulta: 4 de mayo de 2015, http://www.omifacsimiles.com/index.html

Pedraza García, Manuel José. 2004. "El libro antiguo: concepto y estructura". En *Precio y valor del libro antiguo (Textos y materiales),* Jaca, 2-6 de septiembre,

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

coord. por Manuel José Pedraza García, 11-48. Zaragoza: Prensas Universitarias de Zaragoza.

Prieto Guijarro, Laura. 2011. "Los legados musicales. Metodología de valorización: el legado musical de Juan José Mantecón". Ponencia presentada en las *Quintas Jornadas de Archivo y Memoria. Extraordinarios y fuera de serie: formación, conservación y gestión de archivos personales*, Madrid, 17-18 de febrero.

Reyes Gómez, Fermín de los. 2003. "El concepto de libro antiguo". En *El libro antiguo*, Manuel José Pedraza, Yolanda Clamente y Fermín de los Reyes, 11-44. Madrid: Síntesis: biblioteconomía y documentación.

RIdIM (Répertoire International d'Iconographie Musicales). 2015. Zurich. Fecha de consulta: 4 de mayo de 2015, http://www.ridim.org/

RILM (Répertoire International de Littérature Musicale). 2015. The Graduate Center, City University of New York. 2015. Fecha de consulta: 9 de mayo de 2015, http://www.rilm.org/

RIPM (Répertoire International de la Presse Musicale). 2015. Center for Studies in Nineteenth Century Music of the University of Maryland. Fecha de consulta: 9 de mayo de 2015, http://www.ripm.org/index.php

RISM (Répertoire International des Sources Musicales). 2015. Fecha de consulta: 9 de mayo de 2015, http://www.rism.info/en/home.html

Rodríguez Bravo, Blanca. 2002. "Revisión de las clasificaciones documentales basadas en el soporte". *Revista española de Documentación Científica* 25 (1) (enero): 74-86. DOI: 10.3989/redc.2002.v25.i1.87

Sánchez Mariana, Manuel. 1995. *Introducción al libro manuscrito.* Madrid: Editorial Arco Libros. (Instrumenta Bibliologica.)

Smiraglia, Richard P. 2001. "Musical Works as Information Retrieval Entities: Epistemological Perspectives". *Second International Symposium on Musica Information Retrieval.* Bloomington: ISMIR.

Tacón Clavaín, Javier. 2004. "La conservación del libro antiguo". *Documentos de trabajo UCM Biblioteca Histórica* 2: 1-14.

Torres Mulas, Jacinto. 2000. "El documento musical: ensayo de tipología". *Cuadernos de documentación multimedia* 10 (Ejemplar dedicado a I Congreso Universitario de Ciencias de la Documentación. Teoría, historia y métodología de la documentación en España (1975-2000)): 743-748. Fecha de consulta: 18 de febrero de 2013, http://www.ucm.es/info/multidoc/multidoc/revista/num10 /paginas/pdfs/Jtorres.pdf

Unesco, 1948. *Acuerdo destinado a facilitar la Circulación Internacional de Materiales Audiovisuales de Carácter Educativo, Científico y Cultural.* Conferencia General Beirut.

Unesco. 1980. *Recomendación sobre la salvaguardia y la conservación de las imágenes en movimiento.* Conferencia General, Belgrado.

WCCD. 1996. *Nuestra Diversidad Creativa. Informe de la Comisión Mundial de Cultura y Desarrollo,* Javier Pérez de Cuéllar (coord.), A. N. García (ed.). México: UNESCO, Correo de la UNESCO México.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Appendix 1

Typology of scores as per cataloguing and bibliographical treatment

AACR2	The musical document: typology essay	Approximation to the study of typology of the musical document	Approximation to the study of typology of the musical document	Manual of note music
	Short score[1]			
Full Score	Score	*Score*	Director score and score for each part	Orchestral score
Parte[2]	Music or particella	Music o *particella (part)*	Part(s)	
	Reductions:			
	Script[3]		Script	
Piano part [violin, etc.] of the director[4]	Director's parts [instrument]	Part of piano-director, violin-director, etc.	Part of piano-director, violin-director	Reduced score for orchestra director or piano
Vocal score	Vocal score	Vocal score	Vocal score	Cocal score
Score for piano[5]	Reduction for keyboard	*Piano reduction*	Piano reduction	Accompaniment/ keyboard reduction
Abbreviated Score[6]	Abbreviated Score	Abbreviated Score	Abbreviated Score	
Choral score		Choral score	Choral score	

1 Short score. A draft by the composer for a work showing the main features of the composition in only a few pentagrams.

2 Music. Indications for one of the voices or instruments of a musical work (AACR2) (Gorman and Winkler, 1999: 692). Each one of the loose sheets for a voice or an instrument to be performed jointly. Also called particella (GTCCPB, 2010: 145).

3 Script, score summary, only with the main part in two to five pentagrams and by instrumental sections. Each pentagram includes of similar tessituras. These are typical in band and orchestra music. This format must appear in the subject sub-heading in (Iglesias Martínez y Lozano, 2008: 220; GTCCPB, 2010: 145).

4 Part of [instrumento] the director. Music for interpretation to which notes are added showing entries of diverse instruments in order to aid the performer and the director. These are often called "director's piano (or violin, etc.) music". The independent instrument scores habitually accompany this music (Iglesias Martínez and Lozano, 2008: 224). In a work for an ensemble, the instrument music that allows the performer to direct it with the aid of notations of entries of other instruments (GTCCPB, 2010: 146). Music for execution of an instrument in the work of an ensemble, to which notes of entries of other instruments are added in order to allow direction and the performance of the work. (AACR2) (Gorman and Winkler, 1999: 62).

5 Piano score or reduction for keyboard. Reduction of an orchestra score to a piano version in two pentagrams (AACR2) (Gorman and Winkler, 1999: 693). Works originally composed for orchestra or any other instrumental ensemble that have been arranged for piano (Iglesias Martínez and Lozano, 2008: 225).

6 Condensed score. This element registers only the main musical parts in a few number of pentagrams, generally organized by instrumental sections (AACR2) (Gorman y Winkler, 1999: 692).

Pocket score		Study score[8]		Study score
		Open score (reduced)		Reduced score
Page, sheet or volume (p., s., o v.)			p., h., o v. (instrument solos, songbooks and methods	
			Note part[9]	
Short short [10]				

7 Pocket scores. Scores printed in small format that are not generally used in performance (AACR2) (Gorman and Winkler, 1999: 165).

8 Study score. A complete score used for study not performance. The same denomination is used for the pocket or miniature score (RC) (Dirección General del Libro, 1999: 590).

9 Note music. This format is used typically in zarzuela, and it is the same as the voice score, but the instrumental parts are not necessarily reduced for piano, though they can be for any low range instrument. This format sometimes indicates the entry of other instruments (GTC-CPD, 2010: 145; Iglesias Martínez and Lozano, 2008: 210).

10 Close Score. Registers the music in a few pentagrams, often only two. Such is the case for hymns (AACR2) (Gorman and Winkler, 1999: 692).

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

Appendix 2

Descriptions of the type of documents associated with music*

Reference work	Encyclopedias and dictionaries	
	Bibliographies	
	Phonographies	
	Musicographies	
	Catalogues (Complete catalogues with documental value)	
	Iconographies	
	Indices of topical catalogues	
	Musical repertories	
	Introductions and general writings on music	
	Musical documentation treatises	
General foundations of musicology	General expositions	
	Physical and physiological foundations of music	
	Philosophy and psychology of music	
	Stylistic foundations of analysis	
	Musical criticism	
	Musical research	
	Sociology of music	
	Anthropology of music	
	History of musicology	
Ethnomusicoogy	General	General. The World / General expositions / Ethnology. Ethnography. Anthropology / Musical songbooks. Recompilations / Dances / Organology / Texts. Literary songbooks / Stories. Legends / Popular musical theater / Oral poetry / Traditions
	Especial	By region / by continents / by countries / by communities
Musical life – Musical commerce– musical Institutions	Musical groupings	General / Orchestras / Bands / Popular instrumental groupings / Choirs (a cappella groups, etc.) / Instrumental ensembles / Others
	Music institutions	General / Administrative organisms / Professional associations (union, etc.) / Promotional associations. Festivals / Theaters and salons / Teaching centers / Others
	Musical documentation institutions	
	Musical commerce	General / Music publishers / Discography industry / Musical commerce: musical instruments and accessories
	Legal aspects of musical life	
	Praxis musical	General expositions / Musical life. Musical culture / The profession / Music and communications media / Musical production
Pedagogy musical	General expositions	
	Specific methods of musical education	
	Music education in the general education system	
	Specialized musical teaching	
	Extra-curricular, free-time musical education	
	History musical education	

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 129-165

Musical Instruments and their history	Organology and construction of instruments	
	Voice	
	Instruments by families	
	Mechanical instruments	
	Electronic instruments	
History of Music	Introductory Expositions and Sources	
	Complete Expositions	
	Partial expositions of diverse kinds	
	History of music by epochs	
	History of music by geographic zones	
	History of music by topics	
	Biographies of music	
	Biographies of Musical Groups	
	Musical genres and their history	General expositions, vocal music (with and without accompaniment) Instrumental music / Dramatic music / Dance-ballet Religious music, Occidental and non-Occidental rites Moderns music Other genres: popular, private, domestic, military, patriotic, hunting, entertainment, events
Theory of Music – musical performance	General musical teaching and instruction	
	Technical theory	
	Special theory of Music	
	History of the Theory of Music	
	Musical Performance	
	Musical Analysis I	
	Musical Direction	
Music and other sciences and arts	General expositions	
	Librettos	
	Literature (creation)	
	Music and other arts	
	Music and religion	General expositions Legislation and Catholic religious regulations Catholic liturgical books: General expositions, Calendars, Missals, Breviaries, Books of Hours, Psalteries, Pontifical, Rituals, Processionals, Ceremonials. Ordinary of the Mass, Graduals. Antiphonaries Non-liturgical Catholic books: General manuals, Prayer books, Hymnals, Songbooks, Octaves, Novenas, Prayers, Programs Musical life / Rites of diverse religions Music and spirituality

	Music and medicine	General expositions Music therapy. Dance therapy Professional illnesses Education and prevention (postures, relaxation...) Other medical aspects
	Music and technology	General expositions Sound treatment: General expositions, Sound recording and edition Musical informatics: General expositions, Programs and software, Equipment and hardware, Internet MIDI Other standards, formats and supports Other technical aspects
	Music and other materials	General expositions Press and publicity. Typography Music and politics Music and other materials
	Musical graphic images	General / Painting / Sculpture / Printing (stamps and prints) / Photographs / Comics / Other techniques
	Special collections	Sheets. Synoptic tables Various

* Based on Musikako liburuen, partituren eta soinu-grabazioen sailkapen sistematikoa. Systematical classi fication of music books, scores and sound recordings. Bibliotekonomia, Colección Bilduma (EUDOM, 2007: 18-48). This sources was chosen because it is more detailed than the other consulted.

Para citar este artículo:

Reyes Gallegos, Artemisa M. 2016. "Los acervos de documentos musicales. ¿Libros raros, libros especiales?" *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 129-165. http://dx.doi.org/10.1016/j.ibbai.2016.10.007

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.007

So far, so near: profile and perceptions of first-semester students in Undergraduate Library Science programs

Lina Escalona Ríos *
Carlos Miguel Tejada Artigas **

Received:
February 16, 2015.
Accepted:
September 13, 2016.

Abstract

In this work, the profile of new students for the profession of Librarianship and Documentation in order to identify the characteristics and perceptions of young people who choose these professions in terms of choice of occupation, their study habits, knowledge is addressed curriculum and expectations of the profession, among others. All this in order to meet the student's situation and to have adequate evidence to establish their development as students of these professions strategies.

* Instituto de Investigaciones Bibliotecológicas y de la Información de la UNAM, México. lina.escalona@gmail.com
** Universidad Complutense de Madrid, España. cmtejada@ucm.es

Keywords: University education, Library and Information Science, unam, ucm, Profiles, University students, Surveys.

Resumen

Tan lejos, tan cerca: perfil y percepciones de los alumnos de primer curso de Bibliotecología de la UNAM y de la UCM hacia sus estudios
Lina Escalona Ríos y Carlos Miguel Tehada Artigas

En este trabajo se aborda el perfil del estudiante de nuevo ingreso a las carreras de Bibliotecología y Documentación con la finalidad de identificar las características y percepciones de los jóvenes en cuanto a la elección de la profesión, sus hábitos de estudio, los conocimientos del plan de estudios y las expectativas de la profesión, entre otros aspectos. Con base en lo anterior se conocerá la situación del estudiante y se contará elementos para establecer estrategias adecuadas para su desarrollo académico en estas profesiones.

Palabras clave: Formación universitaria; Biblioteconomía y Documentación; unam; ucm; Perfiles; Estudiantes universitarios; Encuestas.

Introduction

One of the elements that characterize the area of Librarianship around the world is its inconsistent social image in which their potentialities are not recognized. A reflection of this is its late incorporation as a university major in many countries and the crisis it has faced in some of them. This deficient social image exerts a negative influence on the choice of university career. A young person between 17 and 18 years-old is very clear about the fields of action of Law, Journalism, History or Psychology, to provide just a few examples. In contrast, a new academic option such as Library Science presents an image of confusion and ignorance. Thus, many students the field because their grades were not high enough to be admitted to other careers, while many others think that they will be "sitting" and reading

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

books, something that is far from the current dynamism that can be found in the current positions in the field of information or business

Purpose of the study

It is the objective of this text to examine the profile of students in Library Science[1] of the universities with the highest enrollment in Spain and Mexico: the Complutense University of Madrid (UCM) and the National Autonomous University of Mexico (UNAM). Specific secondary objectives are as follows:

- To grasp the characteristics of first year students with regard to their personal and academic data, as well as to their reading habits and access to information.
- To identify their motivation in choosing to major in Librarianship and their expectations of securing employment.
- To determine the perception they have of the major and profession vìs a vìs other university options.

Attaining an understanding of specific traits of these students and their expectations about their major are key to being able to plan marketing efforts to attract new students and to design teaching methodologies. It is also important to identify those characteristics, attitudes and aptitudes of the student are best suited to the discipline. The question of aptitudes should be the object of further research.

Methodology

To achieve the proposed objectives, a quantitative social research methodology is used, relying on a questionnaire with 33 questions designed around the following three thematic axes: 1) personal, academic and information use data; 2) motivations and expectations about the ma-

1 At UNAM it is called Licenciatura en Bibliotecología y Estudios de la Información and in UCM it is Grado en Información y Documentación. In this paper Library Science is used to refer to both cases.

jor, and 3) perceptions of the social image of the major and the profession. The survey was designed in Google Docs and the data obtained were exported to the SPSS 12.0 statistical software for processing. The instrument was applied to all students enrolled in the first semester of the UNAM and the UCM in November 2011. The response rate of Mexican students was 81% (73 of the 90 students responding), while the Spanish response rate was 49% (48 of the 98).

Literature review

The aspirations and motivations of the students of Librarianship have been studied in diverse countries, as evidenced by the research of this type in Greece (Moniarou-Papaconstantinou et al., 2010), Norway (Ericson, 2000), Australia (Hallam and Partridge, (Baruchson-Arbib and Mendelovitz, 2004), the United States (Taylor and Newman, (Komi and Ramaiah, 2004), India (Keshava, Ramesha and Vatnal, 2002), Nigeria (Adomi and Ogbomo, 2001), Ghana (Tiamiyu, Akussah and Tackie, 1999) and Switzerland (Deschamps and Deschamps, 1997).

In Mexico, income profile has not been studied in any depth. One of the most important works at the national level, however, is that of Fernández Cruz (2010), which considers the knowledge and skills of students entering the first semester of the library science major, as well as the motivations that led them to choose it.

In Spain, several studies have been carried out in this area. For example, Moscoso (1998) has analyzed the profile and motivations of students at the Universidad de Alcalá, and Tejada (2003, 2008) examined these matters among students enrolled in Universidad Complutense de Madrid; Moro y Mano (2012) looked at students enrolled in the University of Salamanca. The students of latter were also the focus of study of the same kind by Sandin (2010), who approached it from the standpoint of gender.

All of these studies deal with the determining factors for students when choosing a major. This decision is an expression of the personality and vocation of the individuals and a set of ancillary factors, including the influence of family, friends and institute teachers, the job outlook, and the nature of the work. Even the student's love of books can be a determinant.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

Some of these studies emphasized that many students choose Librarianship, because in view of their grade point average it is open to them (Moniarou-Papaconstantinou et al., 2010).

Unfortunately, as many of the studies point out, “librarianship does not attract young people because of the perceptions they have of it” (Newbutt and Sen, 2012: 329). No matter how much progress has been made ove the years, there is still a lack of knowledge about the major and the profession itself. In a Canadian survey of more than 2,000 new students, fully sixty percent thought they did not need university studies to work as a librarian and considered it a “low-prestige” profession (Harris and Wilkinson, 2004). It should be noted that many of these students have had little contact with public and school-based libraries and are unaware of other work environments in which the information professional can carry out his work.

It is important to note that according to Nava Bolaños (2000) the image of the professions arise from the interaction of family, social and educational context and the mass media. In this way, the social image of Library Science and Documentation is far removed from the professional reality because of the lack of such interactions. Students know about the major from a friend or relative, but otherwise do not have accurate ideas about it (Nava Bolaños, 2000).

As noted in the Introduction, stereotypes and the social image of librarians are also determining factors influencing student’s choice of career (Newbutt and Sen, 2012, Genoni and Greeve, 1997, and Rothwell, 1990, among others). Thus, as Sarkanen (2005) pointed out, our image is that of an unfriendly person, who is only concerned about keeping shelves orderly and stamping book checkouts. This image does little to bolster the self-esteem of young people considering the profession and encumbers their academic development. Therefore, it is important for universities offering Library Science and Documentation majors to inform first-year students about the profession, its fundamental values and competences within today’s society.

It should be mentioned that the admission profile goes beyond the motivations that the student has when choosing major. This profile is the set of knowledge, skills, aptitudes and attitudes that the applicant must exhibit, and which is distinct from the administrative requirements for entering professional practice. As an indispensable element in the design of the curriculum, the admission profile, according to Fernández Cruz, “provides the applicant orientation and assess whether he has the knowledge and skills necessary to thrive and face the challenges posed by the major" (2010: 1). In Mexico, the admission profile for candidates of a Bachelor's Degree in Librarianship and Information Studies includes:

General knowledge in the area of humanities, universal history, history of art and literature supporting the students' ability to contextualize the development of librarianship and information studies. Additionally, students should have a good grasp of the English language in order to understand the texts included in course syllabi. The candidate shall have the ability to work in teams, using proper oral and written expression, while handling information and communication technologies. The candidate shall have a proactive approach to learning with a sense of organization and sense of vocation (Draft amendment ..., 2014: 31.)

At the Universidad Complutense Information and Documentation Degree program, the admission profile is very lax, indicating only the prerequisite course of high school studies.[2]

As such, we need to recognize characteristics of our new students in UNAM and UCM and the perception they have of these professions. Moreover, we need to understand the factors influencing their decision to choose the major. This research aims to give an account of these matters.

Analysis of results

Personal and academic particulars and information use

Age. The average age of first-year students at UNAM and UCM is very similar. In the case of the Mexican students, it is 21.7 years-old and for Spanish students it is 22.17. Although institutions of higher education do not set a minimum age for admission, Mexican undergrads students must have at least 12 years of schooling. When schooling starts at age 6 on average, a student can begin degree at 18 years of age. Most students entering the major both in

2 Perfil de ingreso disponible en: http://documentacion.ucm.es/estudios/2013-14/grado-informacionydocumentacion-acceso

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

Mexico and Spain, however, do so between the ages of 19 and 22, as shown in *Figure 1*, suggesting they spent more time in grade school and/or baccalaureate studies than the minimum requirement of 12 years.

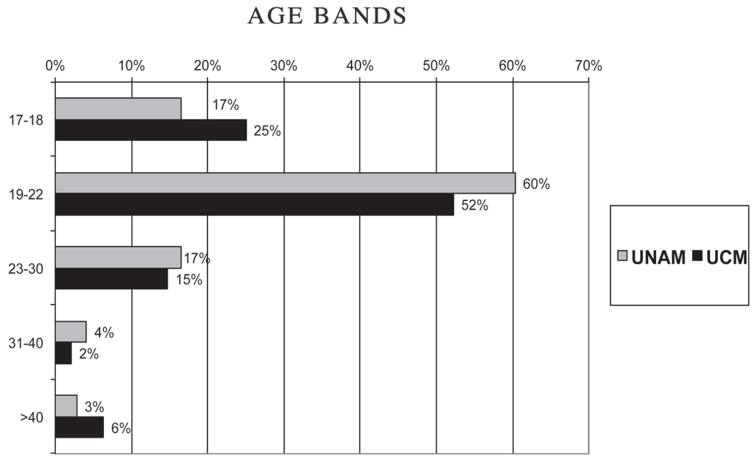


Chart 1. Distribution by age. Porcentages.
Based on students who responded to questionnarie

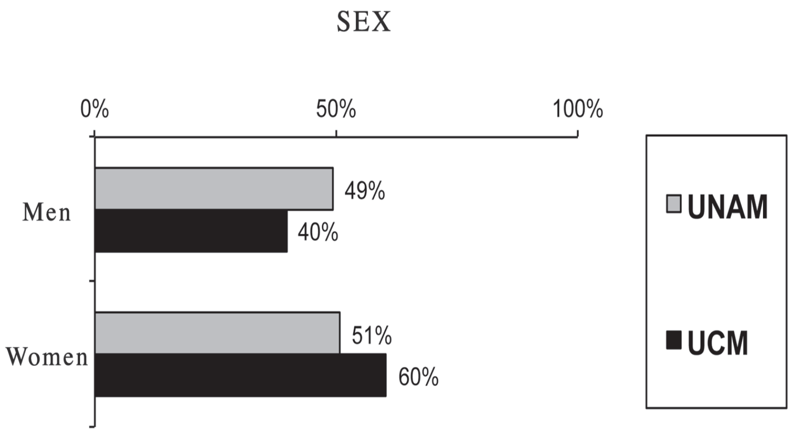


Chart 2. Distribution of students by sex. Porcentages.
Based on students who responded to questionnarie

The maximum and minimum ages of these student bodies are very similar. In the UNAM the youngest candidates are 17 years-old and the oldest is 52, while these ages in UCM are 19 and 50, respectively.

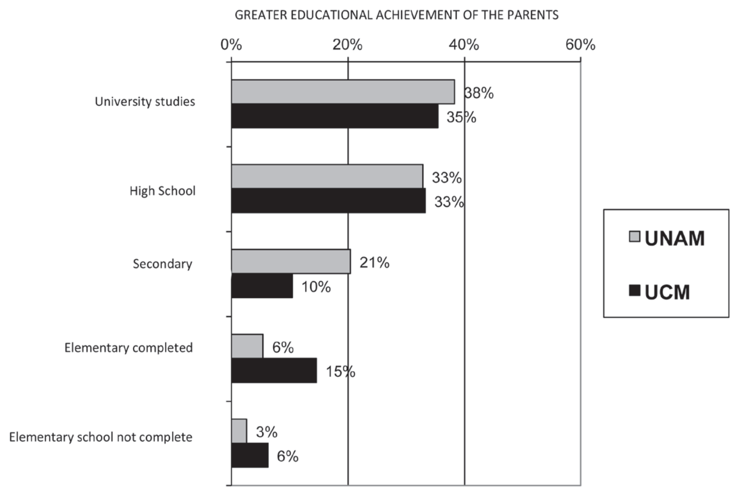


Chart 3. Distribution of students by educational achievement of parents. Porcentages. Based on students who responded to questionnarie

Academic background. To enroll in undergraduate studies in Mexico, candidates must have completed the baccalaureate level diploma in one of the middle-level institutions of education, such as the National Preparatory School (ENP), the Colleges of Sciences and Humanities (CCH) or Baccalaureate Colleges (Colbach), among others. In this respect, Figure 4 shows students of the Library College come mostly from the ENP, largely because of the automatic pass they enjoy, which is to say that by simply choosing the major they are accepted, without need of sitting for and admission exam, as required of students coming from non-UNAM high schools.

As suggested by admission conditions described above, most of the students come from the Humanities and Arts Area (23 of the 33 that indicated this prep school track or 70%) of the ENP, which is the only school that has specific educational tracks. Both CCH and Colbach offer general studies without defined tracks.

In the case of Spain, as expected most of the students came from high school (77%), also from the Social Sciences or Humanities areas of their high school. In this case, 31 of the 40 (77.5%) students who indicated a high school track, quantitative data cannot be provided, there appears to be a general sense that university admission criteria have been lowered in recent years.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

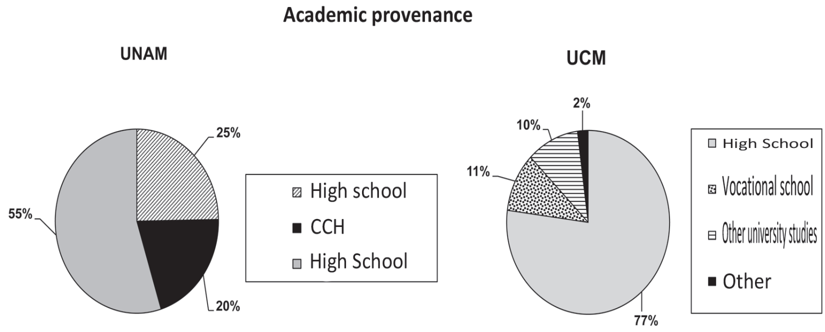


Chart 4 . Academic provenance. Porcentages.

Type of school in which candidates completed secondary education. The UNAM is the largest public university in the country and operates the ENP and CCH high schools. Most of the UNAM's enrollment (75%) are fed in from these UNAM associated schools. For its part, the Colbach belongs to the Secretariat of Public Education. Because of this, the UNAM Library College received candidates exclusively from public schools.

In the case of Spain, the results obtained correspond to the percentages break down as follows: 69% of students come from public schools and 31% from private ones. Thus, according to a report issued by the Ministry of Education on the situation in 2011, "in second stage of secondary education, 74 candidates attended public schools, 14 private schools and 12 private non-concerted centers" (Spain., 2011: 18).

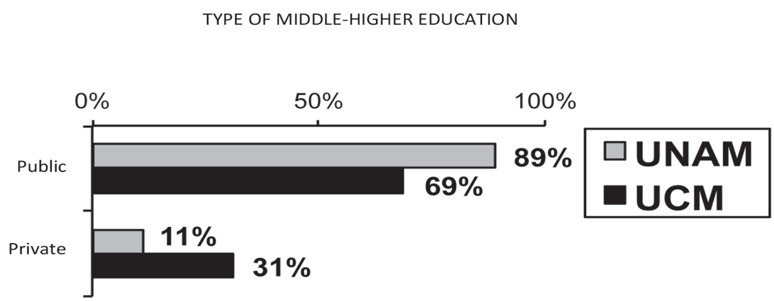


Chart 5. Type og Educaction. Porcentages.
Based on students who responded to questionnarie.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

Average high school grade point average of the entering candidate. The high school grade point average of the student entering the undergraduate program is of utmost importance, as it evidences the knowledge background of the candidate. In the case of UNAM, the average mark is more than one point higher than that of the UCM: 7.78 vs. 6.6.

Perception of the preparation received in the baccalaureate program. An analysis of data obtained shows that the Mexican and Spanish students' perception of the education received in high school is good to excellent. The percentage of responses came in at 78% for Mexico and 82 % for Spain. Since 75% of the students in Mexico who enter the Librarianship major come from UNAM feeder schools, their opinion regarding training received corresponds to their empathy with the university. However, this opinion does not match the perception of teachers. Although quantitative data cannot be provided, there appears to be a general sense that university admission criteria have been lowered in recent year.

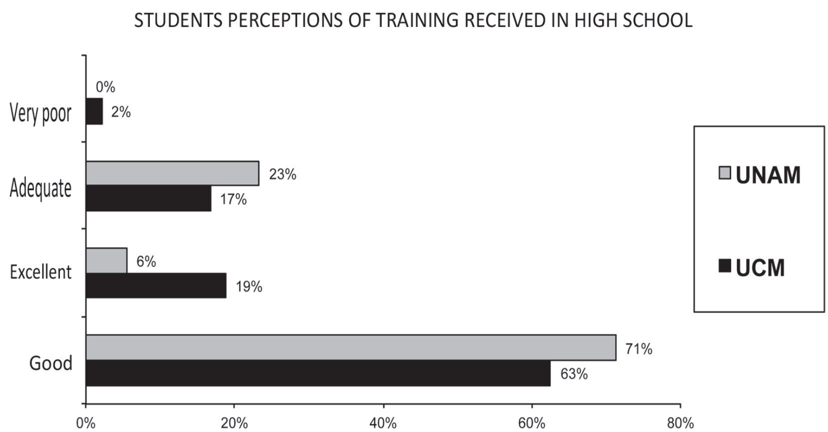


Chart 6. Perception of the training received in high school. Porcentages. Based on students who responded to questionnarie.

Knowledge of the curriculum. The vast majority of students know the curriculum of their major. Curiously, both groups of students reveal the same level of knowledge (92%).

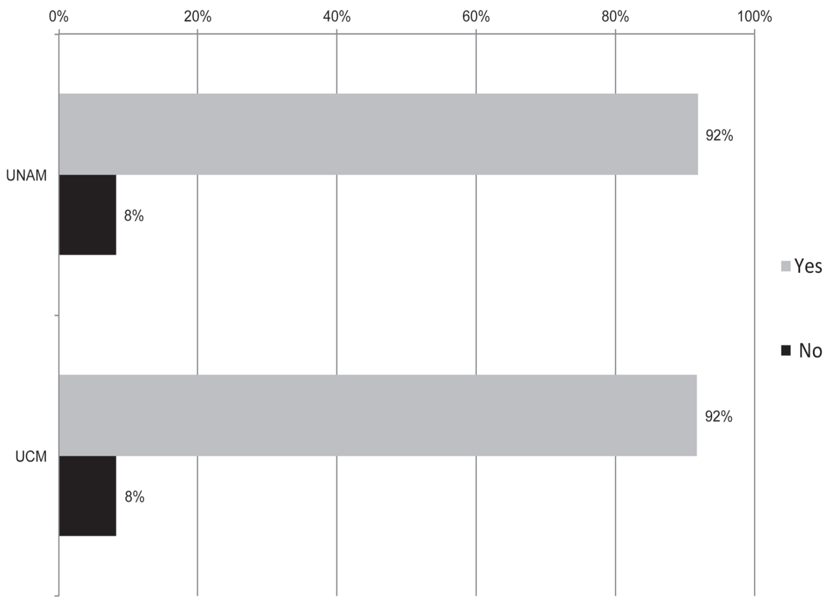


Chart 7. Students who are familiar with curriculum. Porcentages.
Based on students who responded to questionnarie.

Class attendance. Since both universities impart face-to-face course, class attendance is of the utmost importance, as shown by the students' responses.

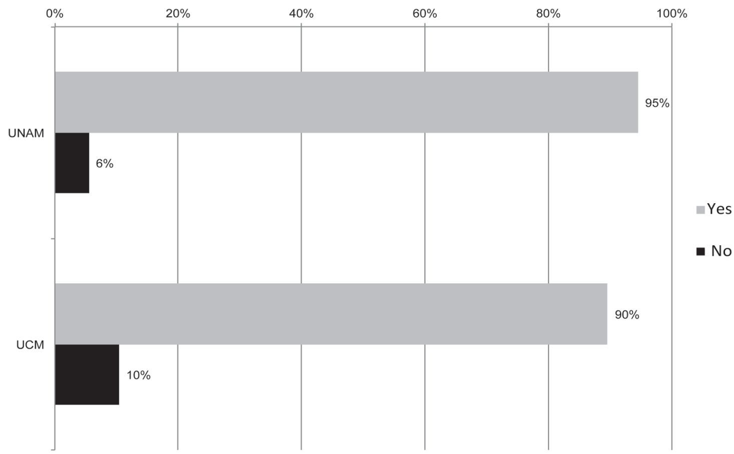


Chart 8. Students who attend classes regularly. Porcentages.
Based on students who responded to questionnarie.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

Number of hours per week, additional to the classes, which the students dedicate to the study. As for the study habits of candidates, Mexican and Spanish students' behavior coincide to a very high degree. On average, the students of the UNAM study 7.78 hours a week while those of the UCM study 7.35 hours per week. The dispersion observed, however, is very high. Indeed, a Mexican student reported 0 hours per week and another Mexican student indicated 30 per week. In the Spanish case, one student reported 1 hour per week and another reported 35 hours per week. In terms of response intervals, the differences are also remarkable, as shown in Graph 9

It is important to note that a high percentage of students (45% for UNAM, and UCM, for 50%) spend less than five hours a week studying, which is very likely insufficient for success in the major.

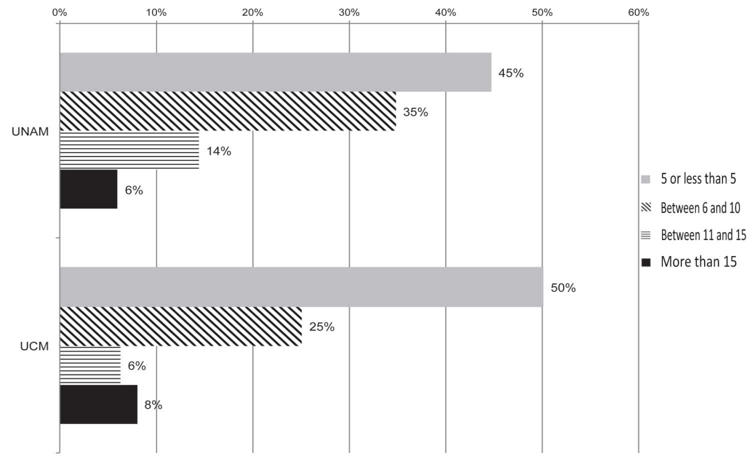


Chart 9. Hours devoted to study. Porcentages.
Based on students who responded to questionnarie.

Habitual reading of literature. One aspect considered desirable in the entrance profile of candidates in Library Sceince is the habit by the reading. The vast majority of enrollees exhibits this quality. This is an advantage, because one of the fundamental activities of our professional is the promotion of reading habits, not to mention that reading habits and strategies are key to the study of the major itself. Unlike previous data, the data obtained from this prompt indicate a remarkable difference between the students of UNAM and those of UCM. The former have a higher rate of habitual reading at 86% versus 60% for the Complutense student.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

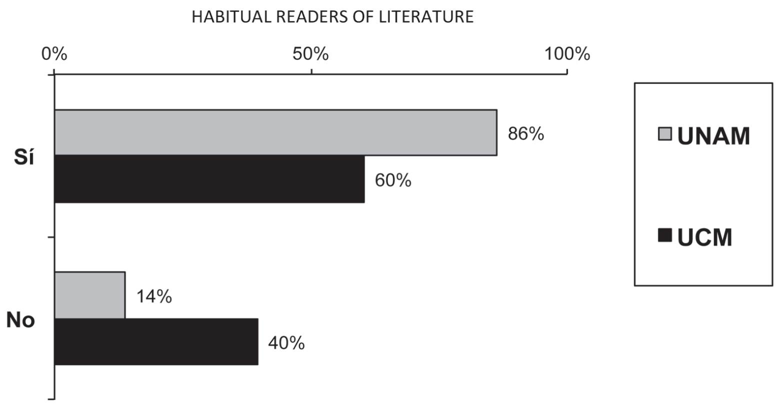


Chart 10. Students who read regularly. Porcentages.
Based on students who responded to questionnarie.

Number of books read per year. Similar to the responses for the previous question, Mexican students read more books a year (an average of 8.31). Nine respondents reported the minimum of two books, and one student report the maximum of fifty. This average is positive, since according to the 2012 National Reading Survey, the average number of books read in Mexico per year is 2.8. In the case of UCM candidates, the average is 6.74 books per year, with four students reporting the minimum of one book, and one student reported the maximum of thirty per year.

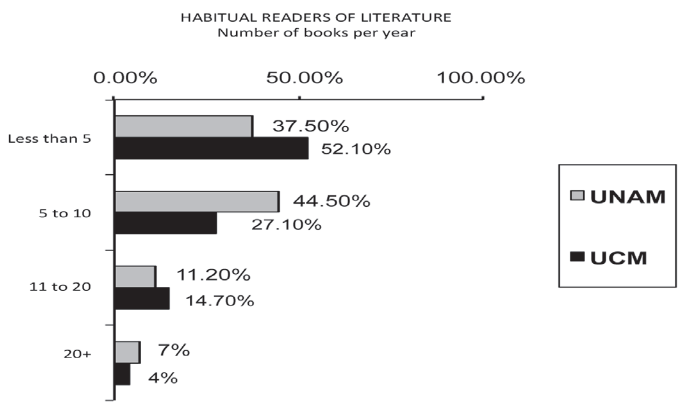


Chart 11. Number of books students read per year. Porcentages.
Based on students who responded to questionnarie and those who stated they read regularly.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

Regular newspaper reading. In this category, the results are better for Spanish students, 73% of which reported regularly reading newspapers, versus 56% for Mexican students. It must be kept in mind that printed newspapers compete with online media and television news programs. As one Spanish students stated: "I do not usually buy the newspaper in my house, but I follow the news on television."

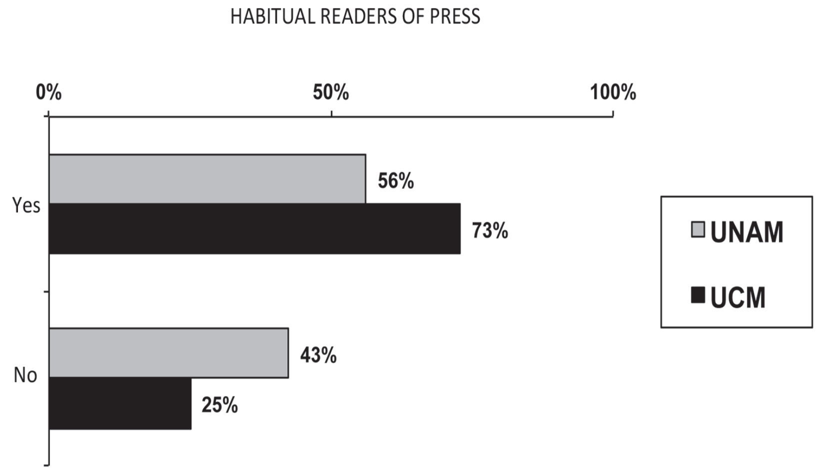


Chart 12. Students who read newspapers regularly. Porcentages.
Based on students who responded to questionnarie.

Moreover, the violence in Mexico dissuades people from reading of the newspaper, as young people tend to avoid constant negative news. Illustrating this, one student said: "I do not like to see how bad the world is. It is very unusual for positive news to be published; and if I need to know about an event or something specific, I search for the news online and see only what interests me and not the murders and horrible things."

Formats of documents consulted. The responses gathered show a certain difference between the types of document consulted by Mexican and Spanish students. Interestingly, almost half of the latter (48%) reported consulting electronic documents exclusively. In the case of Mexico, this percentage is dips to 23%. The percentages for consultation of the printed format are also dissimilar (32% for UNAM, 8% for UCM). In contrast, the option for both types of format exhibits similar percentages (45% in Mexico, 44% in Spain).

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

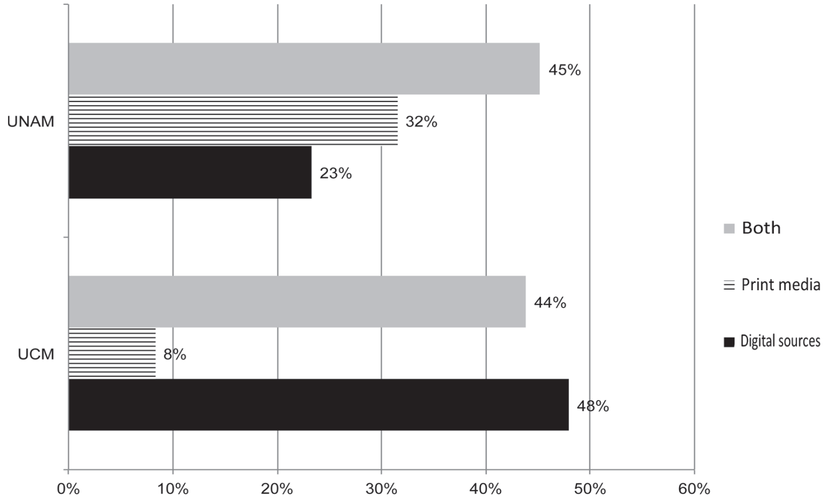


Chart 13. Type of document consulted. Porcentages.
Based on students who responded to questionnarie.

Motivations and expectations of students towards their studies

Main reason for choosing the race. It is striking that one of the compelling reasons to students choose to major in Library Science is a love for books. This matches up well with reported reading habits and the number of books read per year. This option scored the highest response rate among Mexican students (58%); while the figure for came in at 33%.

Fully 40% of Complutense students reported work matters as the main reason leading them to major in Library Science, while 44% of Mexicans shared this view, making it the second most important motivation. In Mexico, librarians enjoy a large job market and have gradually taken over key positions in important library and library systems throughout the country. Moreover, there are still many opportunities for professional librarians in the wide market of public, specialized, school- and university-based, public and private sector information systems. At the time of applying the questionnaire in Spain, the economic crisis had not yet reached its severest point and the labor market was not as depressed as it became by 2013.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

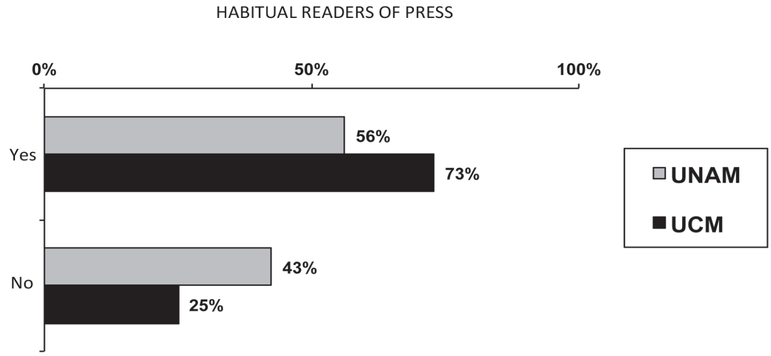


Chart 14. Reasons for choosing LS major. Porcentages.
Based on students who responded to questionnarie.

Influencing factors. Again, we find coincidences in the responses of Mexican and Spanish students with regard to the factors influencing the choice of major. Family consideration was the main factor cited by about one third of the students, with UNAM at 33%, and UCM at 31%. The second factor indicated was the influence of companions and friends, with 21% of Complutense students citing this influence versus 12% for UNAM students. Vocati onal guidance lectures came in at 10% for UNAM and 8% for UCM; while the influence of high school teachers followed by 11% for UNAM and 6% for UCM. Finally, the least reported factor was media influence with 3% for UNAM and 2% for UCM.

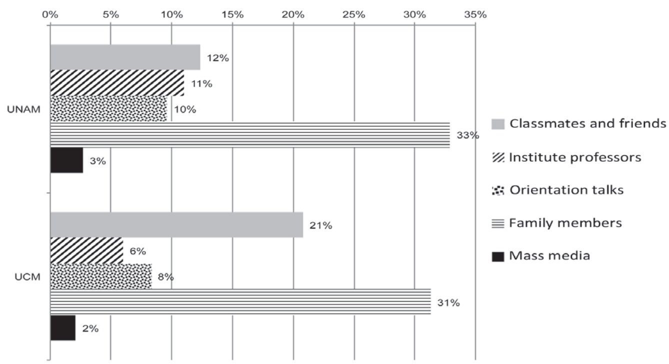
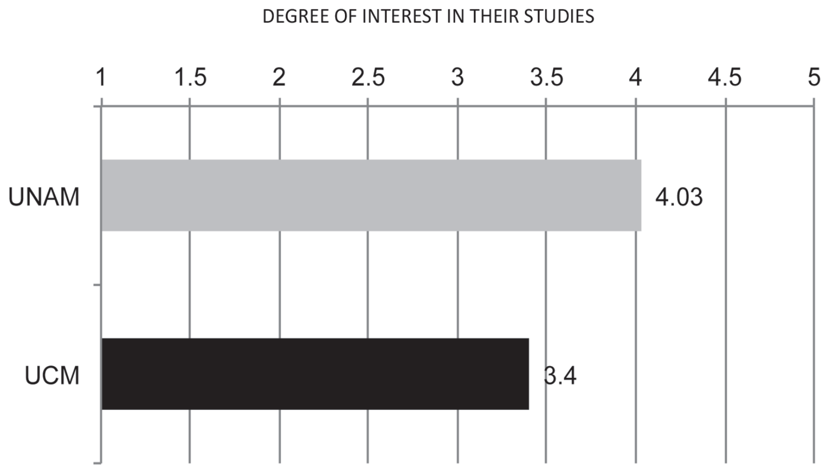


Chart 15. Factor influencing choice of major. Porcentages.
Based on students who responded to questionnarie.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

Degree of interest in these studies. The questionnaire asked the students to rate their degree of interest towards the major from 1 to 5. The result indicates a notable interest, especially in the case of Mexican students with a mean score of 4.03, while in the case of the Spanish students the average came in at 3.40. This may be because students of the UNAM enjoy generally better job opportunities, something that might predispose then to be interested in Library Science as a major.



Gráfica 16. Degree of interest in their studies. Mean over 5.
Based on students who responded to questionnarie.

Option to choose this degree. Directly associated with the previous question, students were asked to state whether the Library Science major was their first choice. The results indicate a remarkable difference between the students of the UNAM, 72% of which indicating it as their first choice, while those of the UCM came in at a lowly 35%. Spanish faculties view this with some concern, as fully two thirds of its students would have preferred to study another major. This situation appears to contribute to a high rate of student abandonment of the major.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

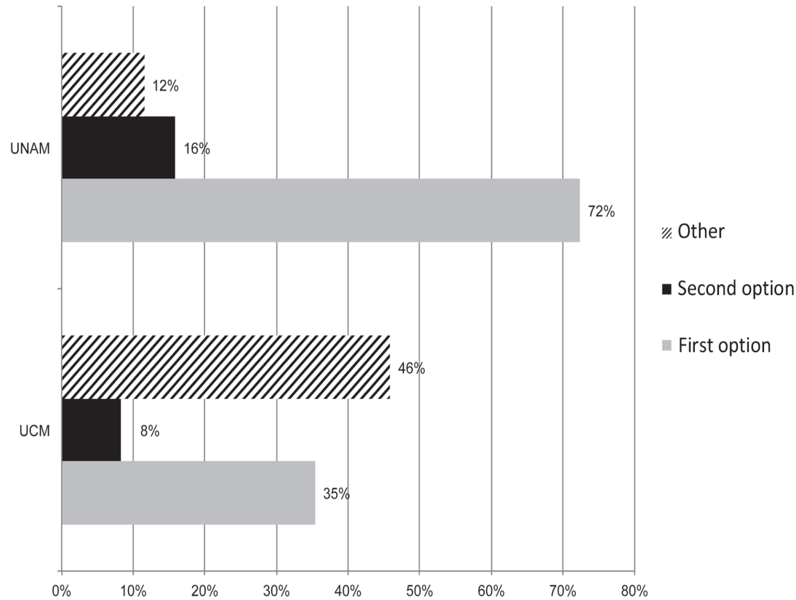


Chart 17. Election of this degree program. Porcentages.
Based on students who responded to questionnarie.

Clarity in the objectives in terms of profile. Our profession is somewhat diffuse, and the skills and abilities acquired by students can be applied in diverse work environments. Consequently, many of the students in both Mexico and Spain are not very clear about the professional profile that they pursue. Fully, 33% of the students of the UNAM and 40% of the UCM reported no having a clear idea of the professional profile pursued. This correlates, in the case of Complutense candidates who study Library Science not as their first choice of major.

The question of the candidate's vocational affinity is key to choosing a major. In this regard, librarianship as a vocational option arrives on a student's radar rather late in the game, since many students only become aware of the existence of Library Science until high school, when they have the opportunity to receive vocational orientation. Therefore, many students who major in Library Science with a sketchy understanding of the profile of the major, and only come to a better understanding over the course of the first year of study. It is, therefore, extremely important to provide students with information in this regard early in the course of study.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

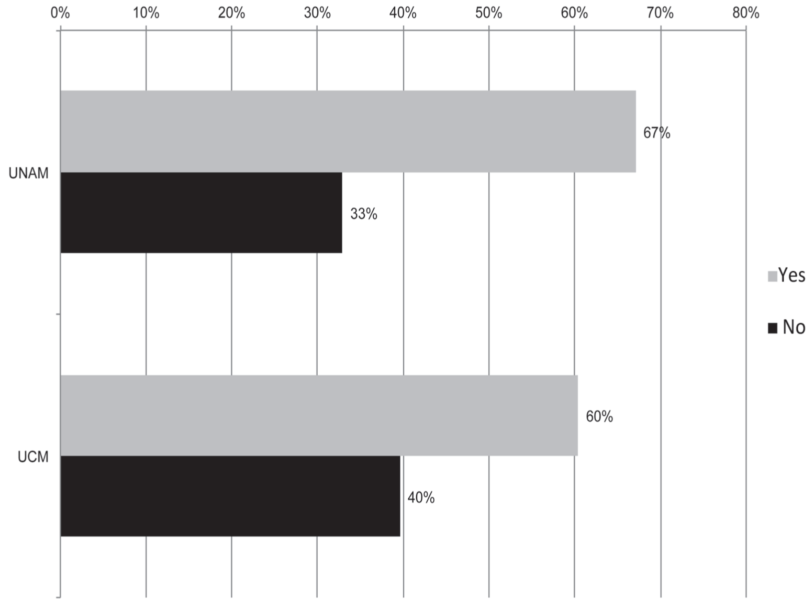


Chart 18. Students who are clear about their chosen mayor. Porcentages.
Based on students who responded to questionnarie.

Profile candidates wish to pursue. Students indicating they were clear about their future professional profile state their job preference. The results show remarkable differences between the students of the UNAM and those of the UCM, with 53% of the former reporting the profile of the librarian as the most important, while 11% of Spanish students indicated the same. Spanish students reported very diverse profiles many of which have nothing to do with the profession. This corresponds again with the fact that many Spanish students study this major without much commitment in terms of their vocation.

Another aspect to emphasize is that Spanish students identify the profile of the archivist as aim of their studies to a greater extent than their Mexican counterparts (the former at 19%, and the latter at 4%). It should also be noted is the high percentage of students, especially Spaniards, who are not clear about their future professional profile. As first-year students, they do not clearly differentiate between the fields of librarian, archivist and documentalist, so this may well be expected.

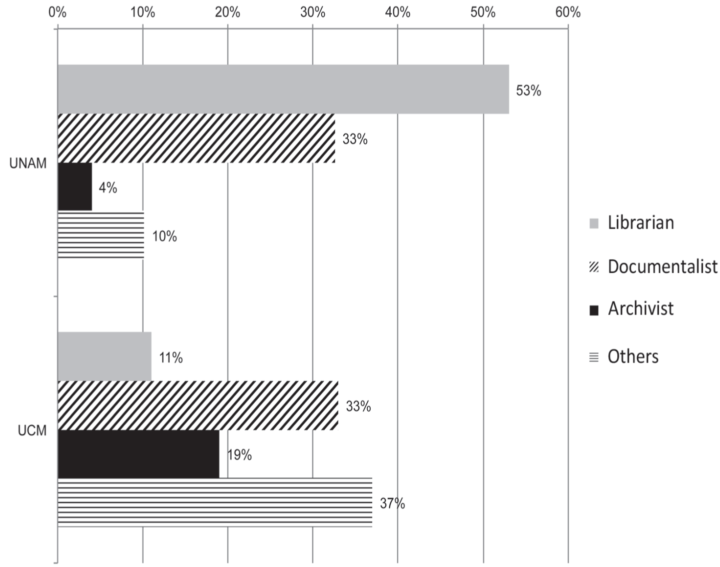


Chart 19. Professional profile students pursue. Porcentages.
Based on students who responded to questionnarie and those who are clear about their chosen major.

Clarity in the objectives regarding the sector. Complementing the profile query, students were also asked if they were clear about the professional sector where they might find work once they graduate. Again there are many students who reported a lack of clarity, with of the UNAM students at 30% and UCM students at 38%. This situation is normal among freshman.

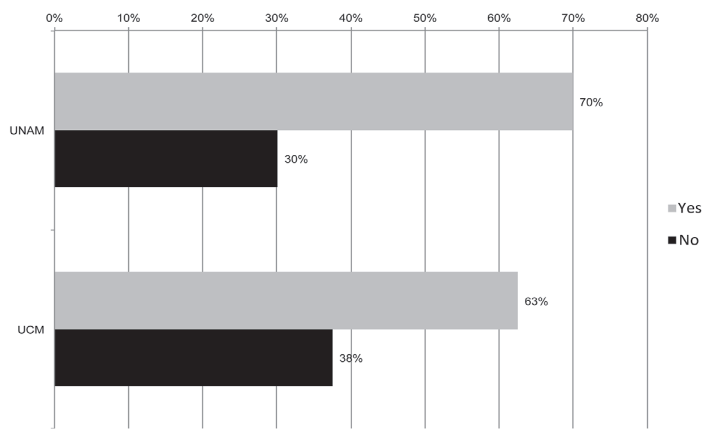


Chart 20. Students who are clear about the major they have chosen. Porcentages.
Based on students who responded to questionnarie.

Sector in which candidates wish to work. Those who responded that that they were clear about the sector were asked to identify it. It is striking that only 33% of students in Mexico and 19% in Spain intend to work in the public sector, indicating candidates are clear about the changes the professional market has undergone worldwide, as work opportunities in companies, NGOs and transnationals have expanded over the last decade. On the other hand, while 22% of Mexican students hope to work in foundations and NGOs, only 2% of Spanish candidates expresses this prospect.

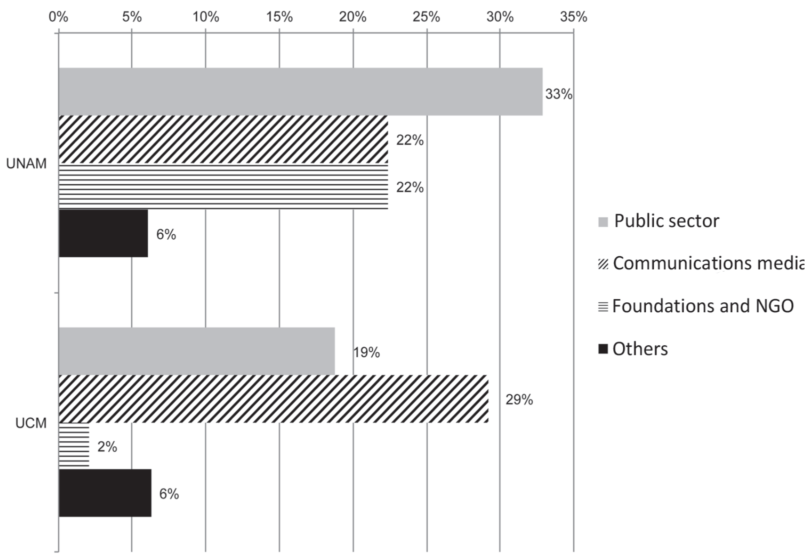


Chart 21. Profession pursued. Porcentages.
Based on students who responded to questionnarie and those who are clear about the professional sector they pursue.

The image of the LS degree and the profession in society

One of the basic aspects for choosing a profession is the image that society has of it. In this respect, first-year students expressed opinions about the prestige and usefulness of various professions, both in the hard sciences and in the social sciences.

Assessment prestige and usefulness of degrees. The students rated this prompt on a scale from 1 to 5, with five being the optimal value. As shown in Figure 22, UNAM students consider Law to be more prestigious, while those at the Complutense University hold the practical professions of Nursing

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

closely followed by Computer Science in higher regard. Computer Science Informatics major was recently opened., As far as usefulness, however, the UNAM students think Library Science is very useful, though they also believe Law is more prestigious, largely because society recognizes the identifies his professional work of the lawyer with ease. Moreover, Librarianship is deemed more useful, because it is a very practical profession for the organization of information, design and provision of services and dissemination of resources, among other professional activities.

Students of the Complutense University expressed more negative views regarding the usefulness of the major than those of the UNAM, with an average score of 3.65 versus 4.15, respectively. Thus, of the six majors, the Spanish students rated Library Science behind Nursing, Computer and Law. In the case of Mexican students, they rank their utility second only to Computer Science.

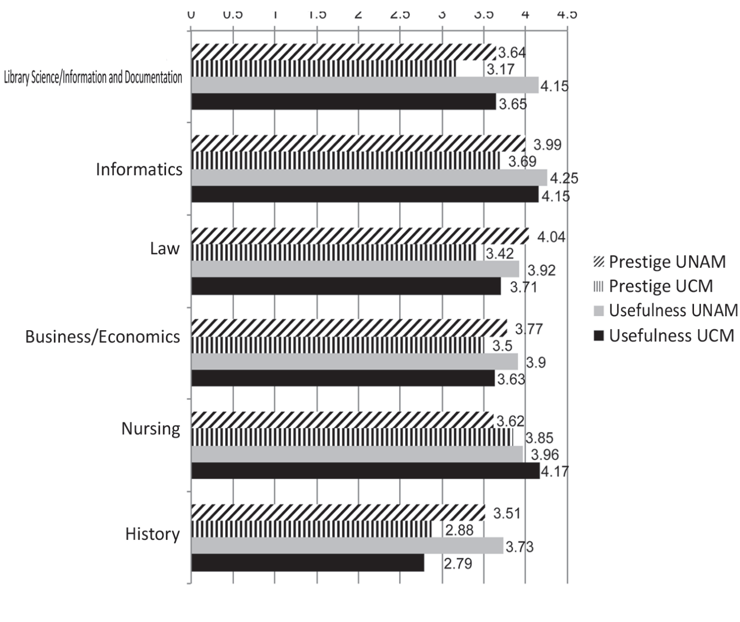


Chart 22. Evaluation of prestige and usefulness of several major. Evaluation over 5.
Based on students who responded to questionnarie.

Recognition of the profession. Although students know that both Library Science and Documentation enjoy a certain level of social acceptance and usefulness, they are aware that these specializations do not have as much prestige as they might like. This view was expressed by 75% of students in Mexico and 67% of those in Spain.

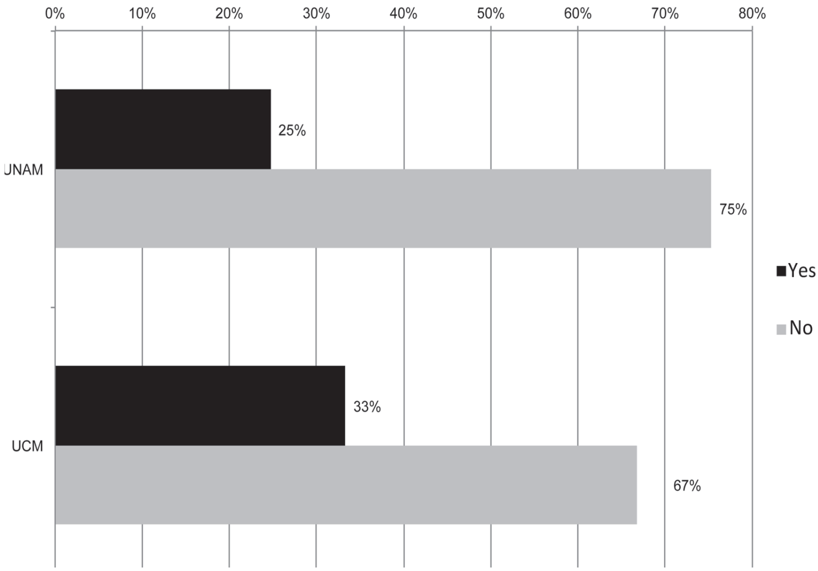


Chart 22. Students who believe the profession enjoys social recognition. Percentages. Based on students who responded to questionnarie.

Conclusions

Strategic planning for university Librarianship studies in must take into account the target students, which is to say, such efforts should consider both the profile of the current students and that of the ideal student, who can aspire to attain the new professional skills associated with information management. A clear picture of the admission profile not only serves to guide students, but also aids authorities in understanding their students and implementing strategies to improve their career in the university.

Thus, an examination of the bibliography and the results of this research reveals there is a certain similarity in the characteristics of the students who decide to study Library Science subjects, though each country retains certain particularities. The most interesting traits of these populations are presented in terms of following three axes of the questionnaire instrument:

- Personal, academic and information use data. There is an increasing percentage of men enrolled in the major. In Mexico, for example, 49%

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

of students enrolled are men, which nearly equals the enrollment of women. The educational level of the parents of both Mexican and Spanish students is medium-high, while revealing the fact that many of their parents do not hold university degrees (62% for UNAM students, and 65% for UCM counterparts). This indicates that university education is expanding throughout society. There is a notable difference in the reading habits between both groups: while 86% Mexican students report reading with regularly, 60% Spanish students report regular reading habits. In contrast, the UCM students read the newspaper more frequently (73%) than UNAM students (56%). This may be due to the fact that the curriculum in Mexico focuses on librarianship, while in Spain the major is increasingly focused on information in general. This may also explain the difference between 48% of Spanish students who claim to consult exclusively digital documents against 23% of Mexican students reporting the same.

- Motivations and expectations of students toward their studies. Closely linked to the above idea, 58% of UNAM students reported the love of books as a key reason for choosing the major, while 40% of UCM students reported this as their primary reasons. On the other hand, other influence factors of family, peers, friends and teachers came in at very similar levels in both groups. The study results show Spanish students chose the major as a fall back option, since their grades were insufficient for admission to other majors. Something similar to this was found in the case of Greece (Moniarou-Papaconstantinou et al., 2010). Only 35% chose this profession as a first option. In the case of Mexican students, the percentage is much more positive, with 72% reporting Library Science as a first option, a result that reflects the generally positive employment opportunities in Mexico. As for the profile and the professional sector they wish to pursue after graduation, a large number of Mexican and Spanish students reported a lack of clarity (33% of the UNAM students versus 40% of the UCM students). In the case of Mexican students who expressed clarity clear, 53% reported wanted to work as librarians, while Spanish students only 11% target librarianship.
- Social image of the Library Science degree and the profession. Both groups of students report higher regard for the utility than the prestige of the major, with Mexicans exhibiting a higher average. Students of both nationalities indicate the low social recognition of our professions (75% Mexicans and 67% Spanish). Likewise, educational institutions must deal with the grade point average of the students enrolled in order to strengthen the areas of knowledge requiring it and thus improve student learning.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

Nowadays universities and their diverse faculties compete to attract of students, since in some cases their survival depends on robust enrollment. Knowing the profile of the student enrolled in our majors is essential managing our teaching and planning strategies to attract new students. The improvement of the academic programs in Librarianship must be constant. Only this way can we improve the social image of our profession.

References

Adomi, E. E. y M. O. Ogbomo. 2001. "Career aspirations of master's degree students at the Africa Regional Centre for Information Science (ARCIS), University of Ibadan, Nigeria". *Information Development* 17 (4): 262-268. DOI: http://dx.doi.org/10.1177/0266666014240953

Baruchson-Arbib, S. y S. Mendelovitz. 2004. "A study of Israeli library and information students' perceptions of their profession". *Libri* 54: 82-97.
Broady-Preston, J. y S. Bell. 2001. "Motivating mid-career LIS professionals: the Aberystwyth experience". *New Library World* 102: 372-381.

Carroll, M. 2005. "Profile of australian library technician students", en *Libres,* 15 (2). http://pandora.nla.gov.au/pan/10236/20060707-0000/libres.curtin.edu.au/libres15n2/index-2.html

Deeming, C. y J. Chelin. 2001. "Make your own luck: a study of people changing career into librarianship". *New Library World* 102 (1160/1161): 13-25.

Deschamps, J. 1996. "Les candidats a l'ecole superieure d'information documentaire, Geneve". *Arbido* 11 (12): 14-15.

y J. C. Deschamps. 1997. "Representations des qualites d'un professionnel de l'information documentaire chez les candidats a l'examen d'entree a l'ESID". *Documentaliste* 34 (1): 33-38.

Duff, W., J. M. Cherry y N. Singh. 2006. "Perceptions of the information professions: A study of students in the Master of Information Studies Program at a Canadian Universit". *Archival Science* 6 (2): 171-192, http://dx.doi.org/10.1007/s10502-006-9027-1

Ericson, A. 2000. "Young librarians well prepared for change". *Scandinavian Public Library Quarterly* 33 (1): 5-8.

Esharenana, E. A. y M. O. Ogbomo. 2001. "Career aspirations of master's degree students at the Africa Regional Centre for Information Science (ARCIS), University of Ibadan, Nigeria". *Information Development* 17 (4): 262-268.

España. Instituto de Evaluación. 2011. *Sistema Estatal de Indicadores de la Educación*. Madrid: Ministerio de Educación, http://www.mecd.gob.es/dctm/ievaluacion/indicadores-educativos/seie-2011.pdf?documentId=0901e72b810b3cc3

Farley-Larmour, K. 2000. "Books and reading' or 'information and access'? Interests, motivations and influences towards information and library studies". *Education for Library and Information Services: Australia* 17 (1-3): 5-18.

Fernández Cruz, Elba. 2010. *El perfil de ingreso de los alumnos a la licenciatura del área bibliotecológica en México.* Tesis, Maestría en Bibliotecología y Estudios de la Información, UNAM, Facultad de Filosofía y Letras.

Genoni, P. y N. Greeve. 1997. "School-leaver attitudes towards careers in librarianship: the results of a survey". *The Australian Library Journal* 46 (3): 288-303.

Hallam, G. y H. Partridge. 2005. *Great expectations? Developing a profile of the 21st century library and information student: a Queensland University of Technology case study.* www.ifla/IVifla71/papers

Harris, R. y M. A. Wilkinson. 2004. "Situating gender: students' perceptions of information work". *Information & Technology People* 17 (1): 71-86.

Julian, C. A. 1979. *An analysis of factors influencing the career choice of librarianship.* Tennessee: George Peabody College for Teachers. http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/3a/1f/f8.pdf

Keshava, Ramesha y R. M. Vatnal. 2002. "Choosing the professional career: A survey of library and information science students in Karnatak University, Dharwad". *SRELS Journal of Information Management* 39 (2): 219-226.

Khoo, C. S. G. y C. K. Ramaiah. 2004. "Profile of LIS applicants selecting different specialisations". *Libri* 54 (2): 67-81.

Moniarou-Papaconstantinou, V., A. Tsatsaroni, A. Katsis y V. Koulaidis. 2010. "LIS as a field of study: socio-cultural influences on students' decision making". *Aslib Proceedings* 62 (3): 321-344.

Moro, M. y M. Mano. 2013. "Motivaciones en la elección de la carrera universitaria: metas y objetivos de los estudiantes del Grado en Información y Documentación en la Universidad de Salamanca", en *Investigación en Información. Documentación y Sociedad. Diálogos entre Brasil y España,* A. Cuevas Cerveró y E. Simeão (coord.), 517-534. Madrid: Facultad de Ciencias de la Documentación (Universidad Complutense).

Moscoso, P. 1998. "Perfil profesional y formativo de los alumnos de la Facultad de Documentación de la Universidad de Alcalá". *Anales de Documentación* 1: 155-170.

Nava Bolaños, G. 2000. *El imaginario en torno a la elección de una carrera: una estrategia de intervención desde la perspectiva del psicoanálisis.* México: Plaza y Valdés.

Newbutt, S. y B. Sen. 2012. "¿Qué impresiones tiene la gente sobre la bibliotecología como carrera profesional?". *Revista Interamericana de Bibliotecología* 35 (3): 329-340. http://www.scielo.org.co/pdf/rib/v35n3/v35n3a7.pdf

Proyecto de modificación del plan de estudios de la Licenciatura en Bibliotecología y Estudios de la Información. 2014. México: Universidad Nacional Autónoma de México, Facultad de Filosofía y Letras.

Rothwell, A. 1990. "The image of librarians". *Library Management* 11 (1): 25-56.

Ruiz Figueroa, Rosenda. 1990. *La formación del bibliotecólogo y el reconocimiento social de su profesión.* Tesis, Maestría en Bibliotecología y Estudios de la Información, UNAM, Facultad de Filosofía y Letras.

Sandin, D. 2010. *Análisis de las motivaciones y expectativas profesionales de los alumnos matriculados en el Grado en Información y Documentación de la Universidad de Salamanca.* Salamanca: Universidad http://gredos.usal.es/jspui/bitstream/10366/82633/1/TFG-Diego%20Sand%C3%ADn%20Enr%C3%ADquez-Final.pdf

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

Sarkanen, A. 2005. *The three 'S's': Shhh, Shelve, and Stamp. An investigation of the extent to which the public view the role of the librarian is influenced by the media.* Sheffield: Universidad de Sheffield.

Simon, A. y M. Taylor. 2011. "Career history and motivations for choosing LIS: A case study at Aberystwyth University". *Library Review* 60 (9): 803-815. DOI: http://dx.doi.org/10.1108/00242531111176817

Taylor, S. D., R. A. Perry, y J. L. Barton. 2010. "A follow-up study of the factors shaping the career choices of library school students at the University of Alabama". *Reference & User Services Quarterly* 50 (1): 35-47.

Tejada, C. M. 2003. "Perfil, motivaciones y expectativas de los alumnos de primer curso de la Escuela Universitaria de Biblioteconomía y Documentación de la Universidad Complutense de Madrid (curso 2001-2002)". *Revista General de Información y documentación* 13 (1): 195-211.

2008. "Los alumnos de la Diplomatura en Biblioteconomía y documentación: un acercamiento a través de una encuesta de la Facultad de Ciencias de la Documentación de la Universidad Complutense de Madrid (curso 2006-2007)", en *Formación, investigación y mercado laboral en Información y Documentación en España y Portugal,* José Antonio Frías y Críspulo Travieso (eds.). Salamanca, Ediciones Universidad de Salamanca.

Tiamiyu, M. A., H. Akussah y S. N. B. Tackie. 1999. "Changes in perceptions and motivation of archives and library students during training at the University of Ghana". *Education for Information* 17 (4): 295-314.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (70), September/December, 2016, México, ISSN: 0187-358X, 167-199.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

Library Science student profile survey

Carefully read each question and all of the response options before choosing one. Thank you for your participation.

*Required

1. Age * in years ____________________

2. Sex *
   - ☐ Male
   - ☐ Female

3. Civil status *
   - ☐ Single (a)
   - ☐ Married (a)
   - ☐ Divorced (a) or widowed (a)

4. Shift in which you are enrolled: *
   - ☐ Morning
   - ☐ Afternoon

5. What is the level of educational attainment of your parents? *
   - ☐ Elementary school incomplete
   - ☐ Elementary school completed
   - ☐ Secondary school completed
   - ☐ High school completed
   - ☐ University studies

6. What delegation do you live in? *

7. What kind of high school did you attend?*
   - ☐ Preparatory
   - ☐ Bachelors
   - ☐ CCH

7.1. If you answered Preparatory in question 7, state the area of concentration: ____________________
7.2. If you answered Bachelors in question 7, state the area of training: ____________________
7.3. If you answered CCH in question 7, state the area of technical specialization: ____________________

8. Type of school in which you studied high school: *
   - ☐ Public
   - ☐ Private

9. Grade point average in bachelors: ____________________

10. Ho9w would you rate the education you received in high school?*
   - ☐ Excellent
   - ☐ Good
   - ☐ Fair
   - ☐ Poor
   - ☐ Very poor

11. Do you habitually read works of literature? *
- ☐ Yes
- ☐ No

12. How many books do you read per year? *

13. Do you habitually read the newspaper?
- ☐ Yes
- ☐ No

13.1. If you answered No in the previous question, state the reasons for not reading newspapers: ____________

14. What kind of documents do you often consult? *
- ☐ Print
- ☐ Digital
- ☐ Both

15. In addition to class time, how many hour per week do you devote to study?* ____________

16. What were your reasons for choosing this major? (You may choose more than one answer): *
- ☐ The job prospects
- ☐ The training provided
- ☐ My grade point average limited my choices
- ☐ For my interests in books
- ☐ Other: ____________

17. What person or persons have exerted the greatest influence on your choice of this major (You may choose more than one answer): *
- ☐ Classmates and friends
- ☐ Family
- ☐ Professors of the school/institute
- ☐ Orientation presentations
- ☐ Mass media
- ☐ No one in particular
- ☐ Other: ____________

18. On a scale of 1 to 5, rate your interest in this major: *

Low interest	1	2	3	4	5	Very interested
	☐	☐	☐	☐	☐	

19. What option did you choose this major in? ____________

20. What was your grade point average with which you applied to university? ____________

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

21. Why did you choose this university over any other? (You may choose more than one answer): *
    - ☐ The prestige of the institution
    - ☐ The major is offered only by this university
    - ☐ Low cost of tuition and fees
    - ☐ The campus is near my home
    - ☐ Other: ______________________

22. Do you feel clear about the professional profile you wish to pursue? *
    - ☐ Yes
    - ☐ No

22.1. If answered YES in the previous question, indicate the professional profile you wish to pursue:
    - ☐ Librarian
    - ☐ Document specialist
    - ☐ Archive specialist
    - ☐ Other: ______________________

23. Do you feel clear about the profession sector you wish to pursue? *
    - ☐ Yes
    - ☐ No

23.1. If answered YES in the previous question, indicate the professional sector you wish to pur sue:
    - ☐ Public sector
    - ☐ Communications media
    - ☐ Consulting
    - ☐ Foundations, NGO
    - ☐ Other: ______________________

24. Rate the prestige of the following majors (1 being the lowest and 5 the highest): *

	1	2	3	4	5
Library Science	☐	☐	☐	☐	☐
Informatics	☐	☐	☐	☐	☐
Law	☐	☐	☐	☐	☐
Business	☐	☐	☐	☐	☐
Nursing	☐	☐	☐	☐	☐
History	☐	☐	☐	☐	☐

25. Rate the usefulness of the following majors (1 being the lowest and 5 the highest): *

	1	2	3	4	5
Library Science	☐	☐	☐	☐	☐
Informatics	☐	☐	☐	☐	☐
Law	☐	☐	☐	☐	☐
Business	☐	☐	☐	☐	☐
Nursing	☐	☐	☐	☐	☐
History	☐	☐	☐	☐	☐

26. Do you believe that library science, documental specialist and archival specialist enjoy the social pres tige they deserve?*

☐ Yes

☐ No

26.1. If you answer NO to the previous question, state the reasons for your answer: ____________________

____

27. Are you familiar with the course of study you are enrolled in? *

☐ Yes

☐ No

28. How interested are you in the course of study you are enrolled in? *

	1	2	3	4	5	
Not at all	☐	☐	☐	☐	☐	Very much

29. Do you attend class regularly? * ____

☐ Yes

☐ No

29.1. If you answered NO to the previous question, state the reasons for your answer:

☐ Because the schedule conflicts with my work and other studies

☐ The classes are not interesting

☐ Other:

30. Are you happy in the school? *

☐ Yes

☐ No

30.1. If you answered NO to the previous question, state the reasons for your answer: ______________

____

____

____

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.008

31. Is there any specific aspect of the school that should be improved? *

- ☐ Yes
- ☐ No
- ☐ Other: ____________________

31.1. If you answered YES to the previous question, state the aspects that should be improved:

- ☐ Technological infrastructure
- ☐ Collections
- ☐ Academic services
- ☐ Teachers
- ☐ Other: ____________________

32. Provide any other comment or observation you deem pertinent: ____________________

33. Which university you are enrolled in*

- ☐ UNAM
- ☐ UCM

Send

Para citar este artículo:

Escalona Ríos, Lina y Carlos Miguel Tejada Artigas. 2016. “Tan lejos, tan cerca: perfil y percepciones de los alumnos del primer curso de Bibliotecología en la UNAM y de la UCM hacia sus estudios” *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 167-199. http://dx.doi.org/10.1016/j.ibbai.2016.10.008

OAIS in the digital preservation of sound archives

Perla Olivia Rodríguez Reséndiz*

Article received on:
January 13, 2014.
Accepted on:
May 14, 2015.

Abstract

How can an organization provide for long-term conservation, information access and management of large volumes of digital audio contents? Currently, this question is a key concern for the audio sound archivist, who faces the challenge of managing vast volumes of digital objects produced in the systematic creation of digitized audio collections. In this situation, document processes, the roles of personnel and the techniques and technologies used in analogue archive management have fallen into disuse. Furthermore, a digitized audio archive collection preservation model has yet to be formulated that can serve in the long term to aid in understanding the terms, concepts and

* Instituto de Investigaciones Bibliotecológicas y de la Información de la UNAM, México. perla@iibi.unam.mx

processes entailed in an audio archive after it has been digitized. In view of this, this paper adopts the Open Archival Information System (OAIS) as a reference model in the long-term design, development and management of reliable digitized audio archives.

Key words: Digital sound preservation, open archival information system, sound archive, sound document.

RESUMEN

El OASIS en la preservación digital de archivos sonoros

Perla Olivia Rodríguez Reséndiz

¿Cómo conservar, dar acceso y manejar grandes cantidades de contenidos digitales sonoros a largo plazo? Esta pregunta expresa una de las preocupaciones actuales de los responsables de archivos sonoros que enfrentan el desafío de administrar vastos volúmenes de objetos digitales que provienen tanto de la digitalización como de la generación sistemática de colecciones sonoras digitales. Ante tal situación los procesos documentales, los roles, las técnicas y las tecnologías utilizados en el archivo analógico han quedado en desuso. Además, se carece de un modelo de archivo digital que garantice la preservación de colecciones sonoras a largo plazo y que ayude a comprender los términos, conceptos y procesos del documento sonoro una vez que ha sido digitalizado. Ante tal escenario, en este artículo se analiza el OAIS (Open Archival Information System) como el marco de referencia para concebir, desarrollar y administrar un archivo digital sonoro confiable, de largo plazo y sustentable.

Palabras clave: Preservación digital sonora; Sistema de información de archivo abierto; Archivo sonoro; Documento sonoro.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 201-225.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

Introduction

The increase in the number of digital sound collections is the result of the transfer of recorded analogue contents to digital supports and increasing growth in the production of digital documents. In Europe alone the annual digitization rate is 280,000 hours.[1]

In conjunction with this increase in digitized sound collections, there has been a rapid expansion of production, distribution and access to digital sound documents,[2] resulting from the recording and re-editing of music, the emergence of audio-on-demand services and online radio broadcasts and sound art platforms and sound landscape, among others. Brylawski and Bamberger[3] have noted that the Web provides access to the greatest number of recordings in digital format as has ever been available in history. Most of the sound documents of digital origin are not systematically collected and many are lost irretrievably.

Documents of a digital origin already make up part of documental collections. Recent research indicates that 89% of European institutions dedicated to the preservation of sound and audiovisual documents preserve only original digital documents, which is to say they do not keep equivalent facsimiles in analogue format or that such analogue documents have not yet been digitized. [4]

In view of the growth of digital sound collections, the traditional preservation model has become obsolete. Consequently, the concept of digital preservation of sound contents has been implemented more widely. Van Malssen[5] cautioned that digital preservation would require new approaches, workflows, tools, resources and skills. Moreover, one must take into account a series of risk factors, including failures in storage media, hardware and software problems, and network service glitches. Other risks include those associated with communication systems used to transfer files, hardware and software obsolescence, human error, natural disasters, external or internal

1 Richard Wright, ICT-2007-3-231161. Status Report 4.
2 Kara van Malssen, "Planning Beyond digitization: digital preservation of audiovisual collec tions", 71.
3 Sam Brylawski y Rob Bamberger, The State of Recorded Sound Preservation in the United States: A national Legacy at Risk in the Digital Age, 48.
4 Natasha Stroeker y René Vogels, "Survey Report on Digitisation in European Cultural Heritage Institutions 2012", 2.
5 Kara van Malssen, "Planing Beyond digitization…", 72.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 201-225.

attacks, and lack of continuity in the provision of economic and organizational resources.[6] Another important risk, which should not be omitted, is loss of metadata associated with thousands of documents. [7] Another factor that jeopardizes digital files is insufficient staffing or turnover of personnel working in the archive, whether because of lack of budget or when a new political administration comes into power. Such turnover, means new staff must learn to the processes to perform digital preservation.

Because of these risks associated with digital preservation, digital archives or repositories must ensure that digital bits remain intact over time, while offering both access and proper management of contents. [8] Several authors have also been pointed out that the digital file must be reliable. This is the central focus of many developments and discussions regarding the care of digitally supported contents. [9]

In the absence of a digital repository model that addresses the risk factors of digital preservation and which also provides a reliable and sustainable service, thinkers over the last decade have attempted to set standards for long-term preservation of digital materials. For this reason, we have begun to use international models and standards such as the Open Archival Information System (OAIS), designed as a model for the creation of an open file information system. Additionally, the Preservation Metadata Implementation Strategies (PREMIS) and METS (Metadata Encoding and Transmission Standard) have been developed to produce, manage and conserve metadata. With regard to auditing and certification criteria of a digital archive, the Trusted Repositories Audit and Certification: Criteria and Checklist (TRAC), issued by the National Archives and Records Administration (NARA) and the Center for Research Libraries (CRL), have been established. Other standards include the Catalog of Criteria for Trusted Digital Repositories, created by Nestor (Network of Expertise in Long-Term Storage of Digital Resources) and DRAMBORA, a set of risk assessment tools created by Digital Preservation Europe and the Digital Curation Center of the United Kingdom.

This article analyzes the OAIS (Open Archival Information Systems), posited as the frame of reference for conceiving, developing and managing a digital sound file. It starts with the presentation of the documental processes

6 David Rosenthal et al., "Requierements for digital preservation Systems"; Kara van Malssen, "Planing Beyond digitization…", 75.
7 *Idem*.
8 *Idem.*
9 S. M. McMeekin, "With a Little Help from OAIS: Starting down the Digital Curation Path".

DOI: http://dx.doi.org/10.1016/j.iibbai.2016.10.009

of a sound file and the changes brought about by digitization of the sound documents. We continue to examine how the sound document, whose contents have been digitized or entered into digital platforms, takes the form of a digital object formed by two essential components, i.e., digital audio (also called essence or media) and metadata. Thereafter, Digital Mass Storage and Management Systems (SGAMD), the first repositories for the conservation of digital sound collections, were established as the antecedent for the management of digital contents of sound files. The presentation of this concept leads to the exegesis and analysis of OAIS as a frame of reference for the creation of a reliable and sustainable sound digital archive information system.[10]

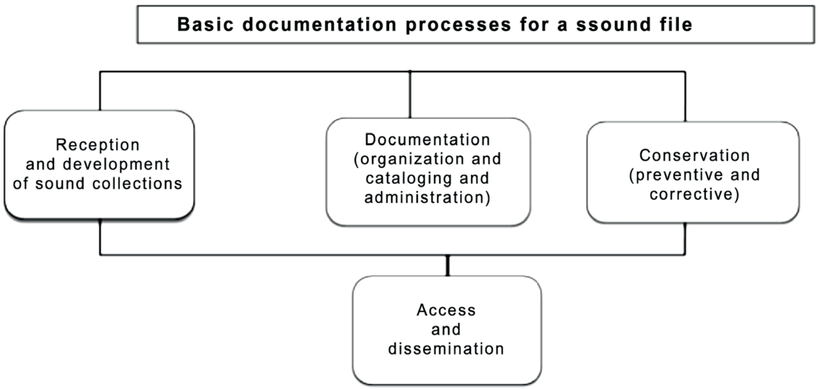


Figura 1. Source: by author

Digitalization of analogue material introduced a new process that modified the preservation tasks[11] (see Figure 2). Digitization has been defined as the process by which the analogue signal is replaced by a digital signal. That is, the contents recorded on various obsolete analogue media are transferred to digital platforms, because the equipment and associated technical maintenance needed to reproduce analogue signals no longer exists.[12]

Mechanical or magnetic analogue media can be digitized. The mechanical supports allow for mechanical recording and reproduction, exploiting

10 LASA, TC 03 *La salvaguarda del parimonio sonoro. Ética, principios y estrategias de preservación.*
11 *Idem*.
12 *Idem*.

groove that is carved into the surface with a needle or sharp instrument. [13] This technique is seen in cylinders of wax, celluloid and amberol; and disks of shellac gum, shellac, vinyl and polystyrene. Magnetic media, extensively studied by Van Bogart, [14] rely on the use of ferromagnetic material to record and reproduce the sound. Wire reels, open spool tapes, cassettes and cartridges are of this type. On the other hand, laser light is used in optical media to write and read encoded data on the recording surface. [15] This type of supports, also called digital supports, are based on the use of binary code used to affix the sound. Recording and reproduction of sound files in this support requires the use of digital technology. These digital technologies include DAT (Digital Audio Tape), CD (Compact Disc), DVD (Digital Versatile Disc) minidisc and Blu-ray. This type of media is not digitized, but rather its content is introduced to digital platforms for preservation and subsequent access.

The digitization and placement of digital content on digital platforms modified traditional documentary processes and entailed new tasks and workflows in the archive, including the creation of a permanent ID or code that links the digital audio (media or essence) to metadata; validation and systematic verification of both cataloging and digitization; immediate access to contents and inventory data once the item is digitized; remote access; permanent verification of integrity and consistency of both digital audio and metadata; daily and periodic backup of the media or digitized audio contents and the metadata and maintenance; and control of temperature and humidity of the digital vault, among others. [16]

In the early days of digitization of analogue contents, the useful life of the digital document and associated preservation requirements were not well understood. Transferring the analogue content to a digital medium was understood as the only way of preserving such contents. Over time, archive specialists realized that a digital preservation model was needed[17] in order to ensure long-term preservation of digital and digitized contents. [18]

13 Miguel Díaz-Emparanza Almoguera, La digitalización de los soportes sonoros en archivos de radio, 136.
14 John van Bogart, Almacenamiento y manipulación de cintas magnéticas. Guía para bibliotecas y archivos.
15 Miguel Díaz-Emparanza, La digitalización…, 158.
16 Perla Olivia Rodríguez Reséndiz, El archivo sonoro. Fundamentos para la creación de una fonoteca nacional.
17 Richard Wright, “Digital preservation of audio, video and film”.
18 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, “OAIS Compliant Preservation Workflows in an AV Archive”.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

Moreover, digital preservation had been seen as a complex field, because of rapid changes in technology and there is no single or clearly recommended solution to such preservation tasks.[19] This situation brought to light the need to about sustainable digital preservation,[20] that provides for the economic, social and technical infrastructure in the long term in order to preserve the data without loss or significant degradation. This entails a comprehensive approach to preserve sustainable goods,[21] while ensuring easy access allowing extensive exploitation and distribution.[22]

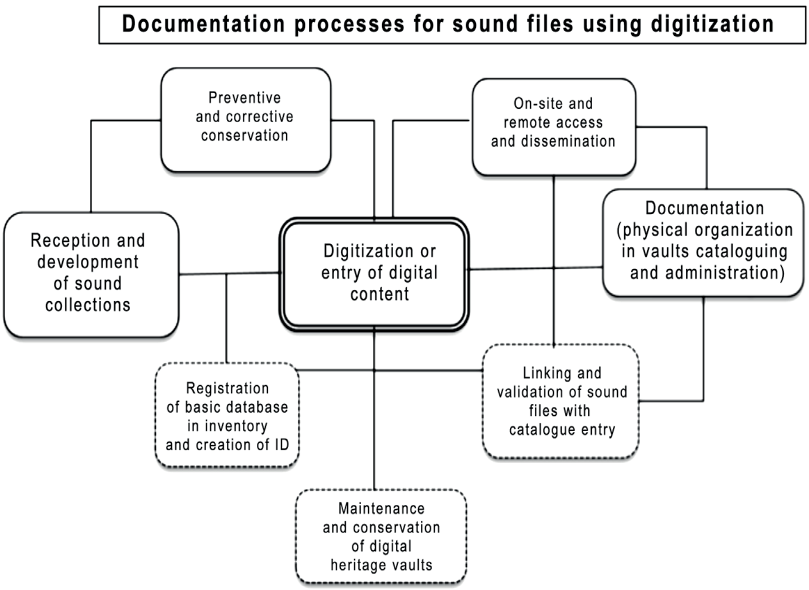


Figura 2. Source: by author

The sound document as digital object

The Charter for Preservation of Digital the Heritage[23] states that long-term digital preservation begins with the design of reliable systems and

19 Milena Dobreva y Nikola Ikonomov, "The Role of Metadata in the Longevity of Cultural Heritage Resources".
20 Kevin Bradley, "APSR Sustainability Issues".
21 Richard Wright, "Digital…", 76.
22 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…".
23 Unesco, "Guidelines for the preservation of digital heritage".

procedures capable of creating authentically stable digital objects. Through digitization and digital entry the sound document, it becomes a digital object consisting of digital audio, also called media or essence, and metadata.

As for audio, the recommended standards set sampling at least 48 kHz. For certain types of content, such as ethnological recordings from research files, frequencies higher than 96 kHz can be used.[24] Additionally, a quantification of at least 24 bits has been established for digitization and digital documents, and the bit depth of the storage technology must be equal to that of the original item. This quantification offers a dynamic range that approximates the physical limits; 16-bit audio (the CD standard) may be unsuitable for many types of materials, especially where very high frequency transitions must be quantified: such is the case for damaged discs. [25] To ensure proper digital preservation, the digitization parameter should be at least 48 kHz per 24 bits. [26]

The IASA TC-04 has established that

> once the audio has been encoded as a data file, its preservation faces the normal manipulation to which digital data is subject, and it must be assigned persistent identifier (ID) and appropriate metadata for administration purposes.[27]

Metadata is a fundamental pillar for long-term management and administration of digitized sound collections. Metadata serve to identify and structure information, and to make it retrievable.[28]

For the purpose of digital preservation, the National Library of Australia[29] suggests metadata should provide:

- Technical information for system administrators to support f decision-making and conservation actions.
- Information on previously adopted conservation actions, such as policies governing migration or emulation.
- Record the effects and consequences of conservation strategies.

24 IASA, *La salvaguarda…*, 9.
25 *Idem*.
26 *Idem*.
27 IASA, *Lineamientos para la producción y preservación de objetos de audio digitales. TC-04*, 3.
28 Annemieke de Jong, *Los metadatos en el entorno de la producción audiovisual*.
29 National Library of Australia, *Preservation Metadata for Digital Collections: Exposure*.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

- Guarantee the authenticity of digital resources.
- Information on the management of copyright and information access.

According to the Working Group on Preservation Metadata, the types of information listed above have two purposes: 1) to provide digital file managers with sufficient knowledge to maintain the digital object's bit string in the long term, and 2) to ensure that the content of a archived object can be represented and interpreted, despite changes in access technologies occurring in the future.[30]

The development and implementation of the metadata has become a field of specialization leading to the creation of PREMIS[31] metadata digital preservation standard.[32] Caplan makes the following observation about the PREMIS:

> Metadata is classified into categories according to the functions they perform. Descriptive metadata serves for identification and retrieval. Administrative metadata aids in management and tracking. Structural metadata indicates how to assemble complex digital objects so they can be viewed or used in some way. Similarly, preservation metadata supports activities whose aim is to ensure the long-term use of a digital resource.[33]

In addition to PREMIS, the Metadata Encoding and Transmission Standard (METS), the standard for metadata exchange and storage, has been created and is a system that operates without regard to the specific needs of the file. METS is a representation standard for expressing the hierarchical structure of digital objects in a library, including the names and location of files comprising digital objects and metadata. METS allows the external use of metadata schemes that can be defined in distinct sections.[34] The common format of information packet transfer between digital repositories is based on the use of METS and PREMIS.[35]

30 OCLC/RLG, *Preservation Metadata for Digital Objects: A Review of the State of the Art,* 4.
31 PREMIS (Preservation Metadata: Implementation Strategies) es el nombre del grupo internacional de trabajo que elaboró el Diccionario de metadatos de preservación que define un conjunto de unidades semánticas que deben entender los repositorios digitales para llevar a cabo la preservación digital.
32 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…", 4.
33 A. P. Caplan, *Entender PREMIS,* 3.
34 M. Addis *et al*., "100 Million Hours of Audiovisual Content: Digital Preservation and Access in the Presto PRIME Project Categories and Subject Descriptors", 6.
35 Angela Dappert y Markus Enders, "Digital preservation metadata standards".

It has been observed that it is necessary to understand the nature of the sound document within a digital preservation environment. In this regard, it should be noted that unlike the analogue sound document, the digital object is polymorphic, which according to Thibodeau exhibits the following features:

- Digital data cannot be permanently attached to a physical support.
- Storage media must be replaced periodically.
- The boundaries of the digital object are difficult to determine.
- Digital objects must be processed for use.
- There is a relationship between what is conserved and what is offered for consultation. [36]

The archivist or sound documentarian, who for many years have had to handle analogue supports artefacts of diverse sizes, materials and forms, is now faced with the challenge of understanding that these sound documents have been replaced by digital objects, which cannot be handled for the purpose of carrying out documental processes, but nonetheless must be subjected to specific preservation processes specific to the digital archive.

Digital mass storage systems

For a long time as analogue holdings grew, sound and audiovisual archives had to negotiate to secure space in storage vaults. The transfer of analogue content to digital platforms through digitization shifted storage from analogue storage vaults to digital legacy vaults housing Digital Mass Storage and Management Systems (SGAMD) were installed. The SGAMD is a fully automated system designed to store, manage, maintain, distribute and preserve a complex set of inherited digital objects and associated metadata.[37] Thus, the analogue file was modified through the creation of a digital file capable of handling a certain number of digital objects logically and adapting to adapt to the constant rules of change.[38] To achieve this flexibility, the solution had to be integrated by several modules. [39]

36 Kenneth Thibodeau, “Wrestling with Shape Shifters Perspectives on Preserving Memory in the Digital Age”.
37 IASA, Lineamientos…, 54.
38 Stephano Cavaglieri, “Criteria to consider in the definition of Digital Mass Storage Systems”, 152.
39 Björn Blomberg, “Sistema de Almacenamiento Masivo Digital”, 99.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

The emergence of Digital Mass Storage and Management Systems[40] coincides with the advent in the 1990s[41] of digital asset management using technologies such as Digital Asset Management (DAM). [42] The first SGAMD in sound archives were installed at the beginning of 1990s and are the antecedent of the first digital sound collection repositories. Schuller has pointed out that the idea of the digital archive was fleshed out within the framework of the 90th anniversary of the *Phonogrammarchiv* in Vienna (at a meeting organized by UNESCO) that gathered manufacturers of technical equipment for sound and audiovisual archives. That meeting highlighted the need, after digitization of the object, for generating an automated copy to support long-term content management. [43]

Over the last three decades, the fundamental design of the digital archive has remained largely unchanged with regard to the functions of storage of media, or essence, and metadata. The contemporary digital archive, however, needs more than a magnetic tape storage room and a spreadsheet for the catalogue,[44] especially in light of the large volumes of digital content requiring preservation. Therefore, it is necessary to conceive of and develop reliable and sustainable digital files that take into account the risk factors associated with digital preservation. In the absence of a model of a digital file in sound collections, the IASA[45] second edition of the *TC-04 Guidelines for the production and preservation of digital audio objects* incorporated Open Archival Information Systems (OAIS) as the standard for designing, developing and managing a digital sound file.

OAIS

In 2003, OAIS was accepted as an international standard for the design of information systems in an open file. [46] The OAIS identifies and describes the

40 IASA, Lineamientos…

41 Àngels Jiménez, "Digital asset management : la gestión de información multimedia en las organizaciones", 453.

42 Kevin Bradley, Hacia un Sistema de Almacenamiento y Preservación en Código Abierto. Recomendaciones respecto a la implementación de un Sistema de preservación de archivos digitales y temas en torno al desarrollo de software.

43 Kate Murray, "Audio for Eternity: Schüller and Häfner Look Back at 25 Years of Change".

44 Hilary Beedham et al., "Assessment of UKDA and TNA compliance with OAIS and METS standards", 6.

45 IASA, Guidelines on the Production and Preservation of Digital Audio Objects.

46 ISO 14721, The Open Archival Information System Reference; Hilary Beedham et al., Assessment of UKDA…, 6.

processes that must be incorporated into data centers, repositories and archives to preserve data in the long term and to make them available to future users.[47]

Although the OAIS was designed to manage physical objects, it has carved out a greater presence in the digital realm, where it is seen as a model for an open file information system[48 49 50] comprising all the functions of a digital repository,[51] while providing the common language and archival conceptual framework for digital storage and preservation specialists.[52] In this way, OAIS contributes to the understanding of archival concepts of conservation and access to digital information. OAIS documents the processes and life cycle of the digital object, since it is incorporated into the digital file.[53] The digital object content (CDO) and its metadata in OAIS are stored in file information packets (AIP).[54]

Theodoridou disagrees with the idea of OAIS as a model. In his view, OAIS does not set forth any particular conceptual model or ontology. It merely posits that each digital information object must be associated with the representation of the information necessary for the interpretation of the digital object, including information about the structure and semantics of the digital object. It suggests that the description of information for preservation (DIP) should contain data on the origin and history of the object, but this is not a specific model.[55]

In addition to these consideration, it has been pointed out that OAIS does not offer a perfect fit for every file[56] and that it focuses on the ability to access and interpret records through the creation of information; but does not provide information about the representation of the preservation

47 B. F. Lavoie, Technology Watch Report The Open Archival Information System Reference Model : Introductory Guide.
48 P. Laughton, "OAIS functional model conformance test: a proposed measurement".
49 M. Dunckley *et al*., "Using XFDU for CASPAR information packaging".
50 B. F. Lavoie, *Technology Watch*…
51 P. Laughton, "OAIS functional model…"; Teresa Silió, "Fundamentos tecnológicos del acceso abierto: Open Archives Initiative y Open Archival Information System".
52 Kevin Bradley, *Hacia un Sistema*…; Milena Dobreva y Nikola Ikonomov, "The Role of Metadata…".
53 M. Theodoridou et al., "Modeling and querying provenance by extending CIDOC CRM", 171.
54 M. Dunckley *et al*., "Using XFDU…", 81
55 M. Theodoridou *et al*., "Modeling and querying…", 171.
56 Milena Dobreva y Nikola Ikonomov, "The Role o f Metadata…"; Dennis Nicholson y Milena Dobreva, *Beyond OAIS: Towards a reliable and consistent digital preservation implementation framework*.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

environment.[57] Criticism has focused on reliability, not only because information (records) should be preserved, but because description of the environment (the "context") used to manage and read records is needed. [58]

Without omitting the theoretical and methodological criticisms of OAIS and the need to have a frame of reference for the creation of a digital archive by which large volumes of digital information are managed, many archives have begun to use this information standard.[59] The OAIS has been seen as the standard for long-term data sustainability[60] and care, as well as a way of enhancing reliability of a digital repository.[61]

In the field of sound archives, these attributes are fundamental in ensuring the digital preservation in the long term. In this regard, Van Malssen has pointed out:

> OAIS is a high-level model of the functions, processes, responsibilities and information required to implement a digital preservation repository. It also defines the mandated duties a digital repository is expected to deliver, including negotiation and acceptance of appropriate information from creators, controlling information to meet long-term preservation, and documenting policies and practices to ensure preservation of information against reasonable contingencies.[62]

Moreover, for an archivist or sound documentalist, it provides the framework, terms and concepts for long-term storing digital objects in a digital file

OAIS has been used to design diverse digital preservation models, such as the Tsinghua Digital Preservation Platform (THDP) and the Joint Information Systems Committee (JISC) of the United Kingdom,[63] among others. In the field of sound and audiovisual archives, the adoption of the OAIS in Presto Prime, a European project for the research and design of technology for the digital preservation of sound and audiovisual collections, [64] stands

57 Reagan Moore, "Towards a Theory of Digital Preservation"; P. Watry, "Digital preservation theory and application: Transcontinental persistent archives tested activity".
58 R. Moore *et al*., "Implementing Trusted Digital Repositories", 5.
59 Kevin Bradley, *Hacia un Sistema…;* Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…".
60 P. Laughton, "OAIS functional model…".
61 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…".
62 Kara van Malssen, "Planing Beyond digitization…", 77. (Traducción propia.)
63 P. Laughton, "OAIS functional model…".
64 M. Addis *et al*., "100 Million Hours…".

out. This move is also evident in the Instituut voor Beeld in Geluid in the Netherlands.[65]

Structure and components of OAIS

OAIS can guarantee the integrity and authenticity of digital objects and thus lay the foundations for the creation of a reliable digital repository.[66] In order to document the integrity of a file requires that the data not suffer corruption during the digital migration. Moreover, in order to demonstration of the authenticity of a file/object over time, we need to know where the document comes from, when it was created, and origin and changes it has undergone throughout history. This process occurs across the phases through which a digital object passes in OAIS. [67]

Van Malssen[68] identifies three areas that OAIS describes: 1) the external environment, 2) the information packages that are preserved and disseminated, and 3) the functional components of the digital archive.

The external environment

In OAIS, the external environment is determined by the production community, the designated community and content managers. The producer community can be anyone outside the digital repository responsible for creating content, such as a radio producer, artist, journalist, researcher, musician or even a curator who selects sound content to be included in the archive. This area has an impact on internal functions, policies, practices and conservation methods and access to content. Content managers are responsible for securing funding, managing and designing strategic plans for digital archive. The designated community is made up of all users of a digital archive, comprised of administrators, curators, educators, creators and the general public interested in consulting digital content.[69]

65 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…".
66 *Idem*.
67 *Idem*.
68 Kara van Malssen, "Planing Beyond digitization…".
69 *Idem*.

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 201-225.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

Information packets

OAIS is built on the basis of information packets, concepts defining the information structure that moves inside, through and outside the archive system. The information package is the digital object, the core of preservation task, including the metadata needed to maintain long-term preservation and provide access.[70] During the digital life cycle, the information packages made up of relevant data and metadata needed for management of digital objects, include following:

1. Submission Information Package (SIP), the incorporation of media, essence or contents and metadata into the system.[71]
2. The SIP is accepted in the system and used to create an Archival Information Package (AIP). [72]
3. Archival Information Package (AIP) is the information package stored and preserved within the system.[73]
4. Dissemination Information Package (DIP) is the information package created to distribute digital content[74] and which can be consulted by users. [75]

Functional components

The functional architectural components of OAIS include intake, access, administration, planning, data management and file storage.[76] These areas are associated through processing flows where metadata are added, thereby creating digital information packets in such a way that an object's life cycle is documented with metadata.[77]

OAIS intake is the process by which content and metadata (SIP) are accepted and verified, and the file information package (SIP) is prepared for storage. Data added during the intake process serve to establish the rights of use of the document incorporated in the digital archive.[78] In the analogue file, this stage corresponds to the collection of sound documents whose incorporation into the archive is done by signing a legal establishing the copyright of

70 B. F. Lavoie, *Technology Watch…*
71 *Idem;* Kevin Bradley, *Hacia un Sistema…*
72 Kevin Bradley, *Hacia un Sistema…*
73 *Idem;* B. F. Lavoie, *Technology Watch…*
74 Kevin Bradley, *Hacia un Sistema…;* IASA, *Lineamientos…*
75 B. F. Lavoie, *Technology Watch…*
76 M. Addis *et al*., "100 Million Hours…".
77 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…".
78 IASA, Guidelines…

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 201-225.

the incorporated documents or collection. For many years this activity was done manually and the agreements were stored in order to account for the legal scope and limitations of the collections. In the digital repository, the rights of use of the digital object must be clearly established from the moment a digital document is incorporated in the information system.

Storage is the function and services required to save the file information package (AIP).[79] Once the packet of information is received from intake, it is added to storage. The integrity of the storage is ensured by verifying that information received during the transfer has not been corrupted and is error free. Inventory information is continuously sent to administration to aid in the historical management of the storage hierarchy.[80] This storage includes the data management module and sub-processes, such as selection of storage medium, transfer to the storage system, validation, security, backup and data restoration.[81] Storage is done in digital legacy vaults.

Data management works in tandem with storage. It is the area that manages and maintains the database of metadata that identifies and describes the contents of the archive.[82] It updates the information that is entered and produces reports when it modifies or erases any data. Data management generates reports of the various components of OAIS. In the analogue sound file, the database is the tool that manages the metadata obtained from cataloging. It has been observed that with digitization, the ID was integrated as a unique identifier linking the media, or essence, to the catalogue record. Data management in OAIS comprises not only cataloging metadata, but also all metadata obtained during the digital object's lifecycle.

The administration in OAIS consists of the services and functions for the overall operation of the archive system.[83] Administration is responsible for establishing agreements with the producer of the sound document in order to incorporate the information. Administration is the assembly point of the OAIS internal and external interactions (intake, storage of files, management and access to data), and external parties (producers, consumers or users and management).[84] In traditional sound archives, the archive directors or managers have been in charge of the administration tasked designed to detect and

79 Kevin Bradley, Hacia un Sistema…
80 CCSDS, *Reference model for an open archival information system*.
81 Kevin Bradley, Hacia un Sistema…
82 Beedham et al., Assessment of UKDA…, 39.
83 Kevin Bradley, Hacia un Sistema…
84 Beedham et al., Assessment of UKDA…, 34.

identify collections to be included in the archive, while evaluating the relevance of donation requests, deploying strategies for collecting at-risk documents, and other activities associated with the integration of sound collections. On the other hand, the aforementioned parties have also had the responsibility of attending to information requests and consultation of sound documents.

Planning activities include supervision of the OAIS environment and ensures that the stored data are accessible to the community of potential users and consumers, allowing interaction with these parties and staying abreast of emerging technologies in the field of information and computing platforms.[85] Planning also establishes long-term digital preservation procedures.

Services and functions in the access area are carried out to help users locate and consult stored information and prepares the diffusion of the DIP. Support for users is also a function of access.[86] For a long time, access to sound documents was limited by the fragility of the documents and dearth of required reproduction equipment. With the advent of digitization, the first listening stations in archives allowed for expanded access to and consultation of the sound documents. Moreover, it became possible to consult the catalogue of sound files by internet and create virtual audiotheque networks.[87]

Reliability

A critical aspect of the creation of a digital archive based on OAIS is the institution that is in charge of a digital archive is also responsible for the conservation of and long-term access to the contents preserved. In this order of ideas the *Trusted Digital Repositories: Attributes and Responsibilities* (TDR) was published in 2002, a document establishing the frame of reference for the attributes and responsibilities to ensure that a digital file is reliable, safe and sustainable and that its permanent preservation and indefinite use is guaranteed regardless of the digital information.[88] Some of the attributes established by TDR in accord with OAIS are a viable organization, sustainable funding, adequate technology and procedures, system security, and appropriate data

85 CCSDS, Reference model…
86 *Idem.*
87 Perla Olivia Rodríguez Reséndiz, El archivo sonoro…
88 RLG, *Trusted Digital Repositories: Attributes and Responsibilities*.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

preservation policies. [89] A practical version of this document is *Trust Worthy* Repositories Audit and Certification (TRAC): Criteria and Checklist.[90]

Additionally, the principles of a reliable digital repository include the commitment to provide continuity and maintenance of digital objects for users, organizational capacity (financial structure, personnel and processes), acquisition and maintenance of rights and legal liability of archival documents, an effective and efficient regulatory framework, acquiring and incorporating digital objects based on established criteria in accord with their commitments and capabilities; and maintaining and ensuring the integrity, authenticity and ease of use of digital objects over time. These principles also include dissemination of contents, a strategic preservation plan and an adequate technical infrastructure to provide ongoing maintenance and security of their digital objects.[91]

The digital file as a system

The OAIS-based digital sound file can be understood as an open file information system (see *Figure 3*). In this regard, Ojeda stated that the creation of digital audio-visual files is based on a set of integrated systems through which all processes and the life cycle of a digital object are developed for reliable, long-term digital preservation.[92] Additionally, the digital archive conceived on the basis of OAIS as an open file information system is the frame of reference for evaluating the extent to which the current file operations consciously reliably reflect the lifecycles of digital objects in the long term.[93]

OAIS provides the terms and concepts for the long-term preservation of digital objects. Moreover, it identifies the participating actors, describes roles and responsibilities in the digital archive.

All files undergoing the process of digitalization sooner or later shall face definition and commissioning of an digital archive or repository. As such, in accord with the experience of the Netherlands Instituut voor Beeld en Geluid

89 IASA, *Guidelines…*
90 RLG, *Trusted…*
91 Digital Preservation Europe, "DPE Repository Planning Checklist and Guidance DPE- D3.2".
92 Gerardo Ojeda Castañeda, *Los archivos audiovisuales en las redes digitales de comunicación para la educación y la cultura*. *Informe de Investigación y Documentación Analítica*.
93 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, "OAIS Compliant…".

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

and with image and sound in Holland, the identification of OAIS was a relevant action in Media Asset Management (MAM), because it clearly illustrates the application that the requirements could have for digital preservation.

It is recommendable to have the requirements complement each other with different components of the information architecture technology.[94]

The incorporation of OAIS in an archive necessarily involves the diverse areas comprising the normal operation of documentary processes in the sound archive. This means that all personnel participating in the collection, stabilization, conservation, administration, cataloging, dissemination and access with analogical documents must be added to the conception, design and implementation of the digital sound open file information system. The conceptual incorporation of a digital sound open file information system on the basis of OAIS can be the method for approaching the archive personnel in the knowledge and awareness of the conservation and management of digital objects.

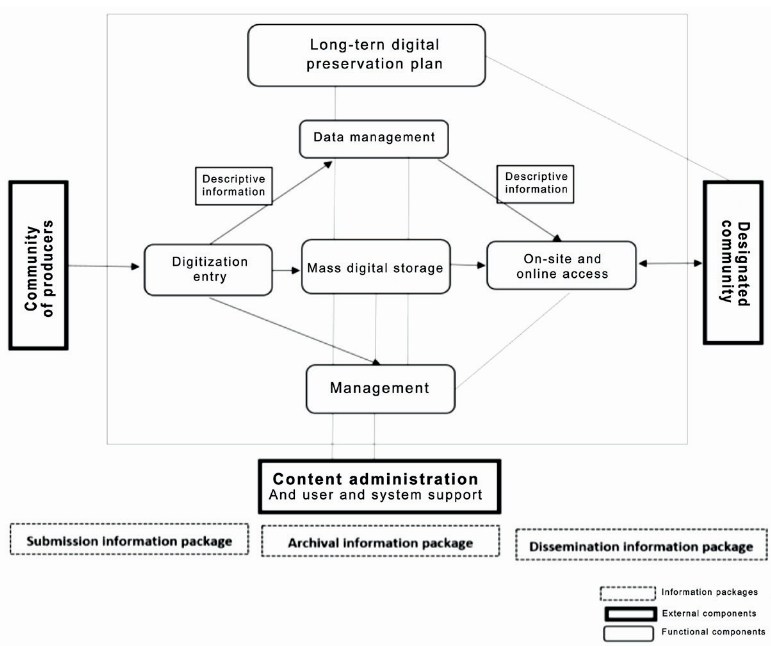


Figura 3. Schematric based on OAIS model

94 *Idem.*

Conclusions

The documentary processes of a sound archive have been modified by the use of digitalization and by the generation and intake of sound documents whose origin is digital. In this situation, the sound document has acquired the form of a digital object formed by two essential components: digital audio, also called essence or media, and metadata. More than two decades ago digital mass storage and management systems emerged as the first digital platforms to manage the digital contents of a sound file. With the growth of digital collections, however, there is a need to have a digital archive or repository model that helps to understand and conceive how to carry out the tasks of reliable, sustainable, long-term preservation of digital sound files that, additionally, are subject to digital preservation risk factors.

Consequently, if digital sound preservation is the sustainable method for permanently conserving, managing, and providing access to digital audio, OAIS is the frame of reference for understanding the nature of the digital object, the components or stages of the life cycle of the digital object and the roles involved in a digital sound file to which the digital sound preservation is applied.

Moreover, OAIS contributes to understanding the transition of the sound document as a digital object on the basis of information packets, a term that incorporates digital sound content and metadata. Information packets participate in the life cycle of the digital object. On the other hand, instead of the documentary processes that are developed in a archive with analogue documents, the digital file exhibits functional components: intake, access, administration, planning, data management and file storage. Likewise, OAIS can identify roles in the interaction and participation of producers or creators of sound documents, the designated community or users, as well as administrators and content managers.

The OAIS provides the basis for the creation of a digital file that is understood as a sound digital information archive system. Through OAIS, files containing digital sound collections can begin to approximate the scheme of operation and functions of a digital archive in which reliable, long-term and sustainable sound digital preservation methods are applied.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

References

Addis, M., W. Bailer, L. Boch, F. Gallo y R. Wrigth. "100 Million Hours of Audiovisual Content: Digital Preservation and Access in the Presto PRIME Project Categories and Subject Descriptors". *DPIF Symposium,* Dresden: Germany, 2011.

Beedham, Hilary, Julie Missen, Matt Palmer y R. Ruusalepp. *Assessment of UKDA and TNA compliance with OAIS and METS standars*. UK Data Archive, University of Essex, 2006. Fecha de consulta: 20 de octubre de 2014, http://www.jisc.ac.uk/whatwedo/programmes/preservation/assetmanagement/oais.aspx

Blomberg, Björn. "Sistema de Almacenamiento Masivo Digital", en *Memorias del Tercer Seminario Internacional de Archivos Sonoros y Audiovisuales*, 97-104. México: Radio Educación, 2006.

Bradley, Kevin. *APSR Sustainability Issues. Discussion Paper,* 2005. Fecha de consulta: octubre de 2014, http://apsr.anu.edu.au/documents/APSR_Sustainability_Issues_Paper.pdf

Hacia un Sistema de Almacenamiento y Preservación en Código Abierto. Recomendaciones respecto a la implementación de un Sistema de preservación de archivos digitales y temas en torno al desarrollo de software. UNESCO, México: Fonoteca Nacional de México, 2007.

Brylawski, Sam y Rob Bamberger. *The State of Recorded Sound Preservation in the United States: A national Legacy at Risk in the Digital Age*. Washington, D.C.: Council on Library and Information Resources at the Library Congress, 2010.

Caplan, A. P. *Entender PREMIS*, 2009.

Cavaglieri, Stephano. "Criteria to consider in the definition of Digital Mass Storage Systems". Ponencia presentada en el Cuarto Seminario Internacional de Archivos Sonoros y Audiovisuales, Fonoteca Nacional, Ciudad de México, 2009.

CCSDS (Consultative Committee for Space Data Systems). *Reference model for an open archival information system*, 2002. Fecha de consulta: agosto de 2014, public.ccsds.org/publications/archive/650x0b1.pdf

Dappert, Angela y Markus Enders. "Digital preservation metadata standars". *Information Standards Quarterly* 22 (2010) (2): 1-13.

De Jong, Annemieke, Beth Delaney y Daniel Steinmeier. *OAIS Compliant Preservation Workflows in an AV Archive*. Netherlands Institute for Sound and Vision, 2013.

Los metadatos en el entorno de la producción audiovisual. México: Radio Educación, 2003.

Díaz-Emparanza Almoguera, Miguel. "La digitalización de los soportes sonoros en archivos de radio". Tesis doctoral, Universidad de Valladolid, 2012.

Dobreva, Milena y Nikola Ikonomov. "The Role of Metadata in the Longevity of Cultural Heritage Resources". *Proceedings of the EACL 2009 Workshop on Language Technology and Resources for Cultural Heritage, Social Sciences, Humanities, and Education –LaTeCH – SHELT&R,* 69-76. Atenas, Grecia, 2009.

Digital Preservation Europe, *DPE Repository Planning Checklist and Guidance DPE-D3.2*, 2008. Fecha de consulta: 4 de noviembre de 2014, http://www.digitalpreservationeurope.eu/publications/repo rts/Repository_Planning_Checklist_and_Guidance.pdf

Dunckley, M., S. Ronen, E. A. Henis, S. Rabinovici-Cohen, P. Reshef, E. Conway y D. Giaretta. "Using XFDU for CASPAR information packaging". *OCLC Systems & Services* 26 (2010) (2): 80-93. DOI: 10.1108/10650751011048452

IASA. *TC 03 La salvaguarda del patrimonio sonoro: Ética, principios y estrategia de preservación*. IASA-Radio Educación, 2005.

Lineamientos para la producción y presevación de objetos digitales TC-04. Kevin Bradley (ed.), IASA-Radio Educación, 2006.

Guidelines on the Production and Preservation of Digital Audio Objects, 2a ed., Kevin Bradley (ed.), 2009.

ISO 14721. *The Open Archival Information System Reference*, 2003. Fecha de consulta: 20 de octubre de 2014, http://public.ccsds.org/publications/archive/650x0m2.pdf

Jiménez, Àngels. "Digital asset management : la gestión de información multimedia en las organizaciones". *El profesional de la informacion* 12 (2003) (6): 452-461.

Laughton, P. "OAIS functional model conformance test: a proposed measurement". *Program: Electronic Library and Information Systems* 46 (2012) (3): 308–320. DOI:10.1108/00330331211244850

Lavoie, B. F. *Technology Watch Report The Open Archival Information System Reference Model : Introductory Guide.* Digital Preservation Coalition, 2004. Fecha de consulta: 20 de octubre de 2014, http://www.avarchivering.nl/node/1482

McMeekin, S. M. "With a Little Help from OAIS: Starting down the Digital Curation Path". *Journal of the Society of Archivists* 32 (2011) (2): 241-253. D OI:10.1080/00379816.2011.619697.

Moore, Reagan. "Towards a Theory of Digital Preservation". *The International Journal of Digital Curation* 3 (2008) (1): 1-8.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

Moore, R., R. Arcot y R. Marciano. *Implementing Trusted Digital Repositories*, 2007. Fecha de consulta: 23 de octubre de 2014, http://ils.unc.edu/digccurr2007/papers/moore_paper_6-4.pdf

Murray, Kate. *Audio for Eternity: Schüller and Häfner Look Back at 25 Years of Change*, 2014. Fecha de consulta: 10 de noviembre de 2014, http://blogs.loc.gov/digitalpreservation/2014/11/audio-for-eternity-schuller-and-hafner-look-back-at-25-years-of-change/

National Library of Australia. *Preservation Metadata for Digital Collections: Exposure*, 1999. Fecha de consulta: 21 de octubre de 2014, http://pandora.nla.gov.au/pan/25498/20020625-0000/www.nla.gov.au/preserve/pmeta.html

Nicholson, Dennis y Milena Dobreva. *Beyond OAIS: Towards a reliable and consistent digital preservation implementation framework.* Centre for Digital Library Research, Information Resources Directorate, University of Strathclyde, IEEE, 2009.

OCLC/CRL. *Trustworthy Repositories Audit and Certification (TRAC): Criteria and Checklist,* 2007. Fecha de consulta: 4 de noviembre de 2014, http://www.crl.edu/sites/default/files/attachments/pages/tr
ac_0.pdf

OCLC/RLG. *Preservation Metadata for Digital Objects: A Review of the State of the Art. A White Paper by the OCLC/RLG Working Group on Preservation Metadata Working Group on Preservation Metadata,* 2001. Fecha de consulta: 23 de octubre de 2014, http://www.oclc.org/content/dam/research/activities/pmwg/presmeta_wp.pdf

Ojeda Castañeda, Gerardo. *Los archivos audiovisuales en las redes digitales de comunicación para la educación y la cultura. Informe de Investigación y Documentación Analítica.* Serie de Informes CNICE. Ministerio de Educación y Ciencia de España, 2008. Fecha de consulta: 20 de octubre de 2014, http://tecnologiaedu.us.es/nweb/htm/pdf/versionpdf.pdf

RLG. *Trusted Digital Repositories: Attributes and Responsibilities.* Research Library Group Report, 2002. Fecha de consulta: 4 de noviembre de 2014, http://www.oclc.org/content/dam/research/activities/trustedrep/repositories.pdf?urlm=161690

Rodríguez Reséndiz, Perla Olivia. *El archivo sonoro. Fundamentos para la creación de una fonoteca nacional.* México: Library Outsourcing, 2012.

"Desafíos de la preservación digital de archivos sonoros". Ponencia presentada en Conferência Internacional Acesso Aberto, Preservação Digital, interoperabilidade, Visibilidade e Dados Científicos, Brasil, 2014.

Rosenthal, David, Thomas Robertson, Tom Lipkis, Vicky Reich y Seth Morabito. "Requierements for digital preservation Systems", *D-Lib Magazine* 11 (2005) (11): 1-22.

Silió, Teresa. "Fundamentos tecnológicos del acceso abierto: Open Archives Initiative y Open Archival Information System". *El profesional de la información* 14 (septiembre-octubre 2005) (5): 365-380.

Stroeker, Natasha y René Vogels. *Survey Report on Digitisation in European Cultural Heritage Institutions 2012*, Panteia (NL), 2012. Fecha de consulta: octubre de 2014, http://www.enumerate.eu/fileadmin/ENUMERATE/documents/ENUMERATE-Digitisation-Survey-2012.pdf

Theodoridou, M., Y. Tzitzikas, M. Doerr, Y. Marketakis y V. Melessanakis. "Modeling and querying provenance by extending CIDOC CRM". *Distributed and Parallel Databases* 27 (2010) (2): 169-210. DOI: 10.1007/s10619-009-7059-2

Thibodeau, Kenneth. "Wrestling with Shape Shifters Perspectives on Preserving Memory in the Digital Age". Conferencia presentada en The Memory of the World in the Digital age: Digitization and Preservation, 26-28 de septiembre, Vancouver, British Columbia, Canadá, 2012.

Unesco. "Guidelines for the preservation of digital heritage". National Library of Australia. Memory of the World Program, 2003. Fecha de consulta: 2 de octubre de 2014, http://unesdoc.unesco.org/images/0013/001300/130071e.pdf

Van Bogart, John. *Almacenamiento y manipulación de cintas magnéticas. Guía para bibliotecas y archivos.* National Media Laboratory, 1998.

Van Malssen, Kara. "Planning Beyond digitization: digital preservation of audiovisual collections", en *Zorgen voor onzichtbare assets. Over het behoud van digitale AV-collecties,* Annemieke de Jong (ed.), 68-91. The Netherlands Institute for Sound and Vision, 2011.

Watry, P. "Digital preservation theory and application: Transcontinental persistent archives tested activity". *International Journal of Digital Curation* 2 (2008) (2): 41-68.

Wright, Richard. "Digital preservation of audio, video and film". *Vine* 34 (2004) (2): 71-76. DOI:10.1108/03055720410550869—*ICT-2007-3-231161 Status Report 4*, 2011.

Para citar este artículo:

Rodríguez Reséndiz, Perla Olivia. 2016. "El OAIS en la preservación digital de archivos sonoros." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 201-225. http://dx.doi.org/10.1016/j.ibbai.2016.10.009

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.009

Open Archival Information System (OAIS): lights and shadows of a reference model

José Ramón Cruz-Mundet.
Carmen Díez-Carrera.

Article received on:
January 13, 2014.
Accepted on:
May 14, 2015.

Abstract

The Open Archive Information System (OAIS) reference model is an ISO standard originally developed by the Consultative Committee for Space Data Systems (CCSDS). The model serves to define the processes for effective, long-term preservation of information, while ensuring access to them. This model also provides a common language to describe these objects and has been widely accepted in the digital preservation community. Although it is not an application architecture, many experts have called into question its use. This paper examines the features of the model and the scientific controversy arising from

* Ambos autores pertenecen ala Universidad Carlos III de Madrid, España.
(joseramoncruz@uc3m.es) ; (carmen.diez@uc3m.es)

its adaptability to diverse scenarios and wide-spread implementation.

Keywords: OAIS; Digital Preservation; ISO; Information Architecture; Electronic records; Standardization

Resumen

Sistema de Información de Archivo Abierto (OAIS): luces y sombras de un modelo de referencia
José Ramón Cruz-Mundet.y Carmen Díez-Carrera.

El Modelo de Referencia OAIS: Sistema de Información de Archivo Abierto es una norma ISO, desarrollada originalmente por el Consultative Committee for Space Data Systems (CCSDS), que define los procesos necesarios para preservar y acceder a los objetos de información de forma efectiva y a largo plazo, y establece un lenguaje común que los describe. Ha sido aceptado por buena parte de la comunidad implicada en la preservación digital, aunque no se trata de una arquitectura de aplicación, lo que ha llevado a numerosos expertos a poner en duda su utilización. El trabajo analiza las características del modelo y la controversia científica producida por su puesta en práctica y su capacidad de adaptarse a los diferentes escenarios.

Palabras clave: OAIS; Preservación Digital; ISO; Arquitectura de la información; Documentos electrónicos; Normalización

Introduction

OAIS is a trending topic in the professional environment; and although the search engine par excellence will ask us if we meant “oasis” when entering the acronym, results exceed by far 800,000 hits. Attached to the “conformity,” hits change hardly at all, something difficult to understand as we address the matter: But is conformity to OAIS possible? To answer this

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

question preliminarily, let us clarify that this is a reference scheme on how a file information system for permanent digital preservation should be. If we move our focus from the professional literature to the information of the numerous preservation projects provided by software vendors, the impression does not change. This work attempts to account for this apparent misunderstanding. This study aims to describe, elucidate and analyze the model in the context of other emerging models, thereby contributing to an adequate understanding and knowledge of it. This endeavor is the result of a larger research effort focusing on permanent digital preservation and its economic sustainability, whose results shall be published in installments.

OAIS is a complex model mainly because its many nuances give rise to terms, mostly recent coinages, requiring effort, concentration and comprehension on the part of the reader and the help of a list of acronyms with their development. An OCLC paper (perhaps the first to address such matters), already has pointed this out.[1] The systematics are understandable, especially for an archivist and those who understand the functions of a document and archive management system. What we might call "small print," the detailed content of the standard; however, configures a text of enormous complexity and is elaborated fundamentally by and targeted at engineers and systems experts. In fact, the model has been developed by the ISO TC/20 specialized in the aerospace. As such, for most users, even those abreast of digital preservation, reading it might remind us of the contracting party scene in the Marx Brothers movies "A Night at the Opera."

The Open Archival Information System can suggest two ideas: open archival information system and open system of archival information. The first is the most frequently used and produced by the translators, and in any case the adjective (open) refers to the archive information system, not just to the archive. The model itself makes this clear, by stating that the term "open" is used to imply that it has been developed in open forums and does not mean that access to the file is unlimited (p.1-1, since we use the original text, references cites the original pagination, with the first digit indicating the section and the second, the page).

OAIS is a reference model that defines the processes necessary to preserve and access information objects effectively and in the long term. Moreover, it establishes a common language to describe such objects. As its name implies,

1 Meg Bellinger, "Understanding Digital Preservation: A Report from OCLC".

it is a only a model, and does not specify how things are done, but rather provides the framework for performing tasks successfully, while describing the basic functionalities and types of information required of the preservation environment.[2] OAIS identifies the mandatory duties as well as the paper and digital interactions negotiated among producers, consumers and document managers. It provides a standardized method for describing repository functionality, detailed models of information and archival functions.[3]

This model emerges as a result of the work of the Consultative Committee for Space Data Systems (CCSDS) – a standards body focused on earth and space data. Its development has embraced a broader scope and has gained acceptance across a wider range of stakeholders than the CCSDS.[4] The participants in the creation of OAIS tried apply it to a wide variety of repositories types. In this sense, OAIS became a widely adopted lingua franca for archival information systems, because it enables effective communication between national and international projects.[5]

The OAIS reference model represents a rare case of success in the history of the use of ICT methods. The model has enjoyed widespread great acceptance across a diverse range of professional communities, facilitating the conceptual and practical exchange of information among them.[6]

OAIS is omnipresent, almost a mantra, in the literature and theoretical and practical developments in the field of digital preservation. However, as evidenced by the use and interpretations of it in the Hispanic community, not everyone seems to fully grasp the reference model. As such we hope to provide a certain level of detail and help those interested grasp the true dimension and scope of the same, a task to which we will dedicate the epigraphs 2 to 7. We begin by describing the origins and the context in which it unfolds, and then proceed to analyze its object and scope, the foundational conceptual model, the model itself and further developments. The final section deals with the more controversial aspects of the model. We know that reader may want to know more about such matters. We have performed an exhaustive review of the

2 Raivo Ruusalepp et al., "Standards Alignement", 119 ss
3 Gregory S. Hunter, Custody of Digital Records: Options and Implementation Considerations.
4 Christopher A. Lee, "Open Archival Information System (OAIS) Reference Model".
5 Jens Klump, "Criteria for the Trustworthiness of Data Centres".
6 Achim Oßwald, "Das Referenzmodell. OAIS – Open Archival Information System. Einführung".

specialized literature up to September 2014, and very little it appears has been written on the subject.

Origins and context of the model

This practice is recommended by the Consultative Committee for Space Data Systems (CCSDS), founded in 1982 by leading aerospace agencies around the world as a multinational forum whose purpose is to study issues of space data systems and offer technical solutions in the form of recommendations for the development of data communication systems and spaceflight standards. In 1990 the CCSDS reached an agreement with ISO, allowing the recommendations of CCSDS, after a review and voting process, to become formal standards following.

At the request of ISO, work in this regard began in 1994 in an open, cooperative work environment described by Lavoie in his report for the Digital Preservation Coalition (2004), and even more exhaustively by Lee in his doctoral thesis devoted to the subject.[7] The *Encyclopedia of Library and Information Sciences*[8] also addresses this matter in more condensed entry. The Committee found that there was no generally accepted framework serving as the basis for policy development. For example, there are no shared concepts and terminology on digital preservation, basic functions of a digital archive system, and attributes of information objects to which preservation efforts can be aimed.

In the absence of a common framework, CCSDS began by developing a reference model defining the basic functional components of a system devoted to the permanent preservation of digital information, the internal and external key interfaces of the system, and characterization of information objects managed by the system, all of which are based on a set of well-defined terms and concepts that transcend the vocabularies of a specific domain and that should list the minimum requirements to be met by the archive system. The reference model needs to be a comprehensive and consistent framework for describing and analyzing digital preservation projects, while also providing a solid foundation and guiding principles for future policy developments.

7 Christopher A. Lee, Defining Digital Preservation Work: A Case Study of the Development of the Reference Model for an Open Archival Information System.

8 Christopher A. Lee, "Open Archival…".

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

The first draft for review was issued in May 1997, and in May 1999 the second draft was released. The latter was approved as a draft by ISO in 2000. After eight years of effort, the final version was released in January 2002[9] and the current version in June 2012; Both of these were approved as ISO 14721. The text of the standard can be downloaded from the CCSDS web page,[10] where it appears under the heading of Recommended Practices. These recommendations are descriptive in nature and are intended to provide general guidance on how to deal with a problem associated with support for space missions. The previous version came under the heading of Recommended Standards, which are prescriptive in nature and indicate how the infrastructure supporting space missions should operate and interoperate with one another.

Faced with the need to solve the problems associated with safeguarding digital or analog data and accustomed to solving complex problems and developing pioneering solutions, space agencies within the CCSDS decided to tackle the issue of digital preservation and the concept of electronic archiving. The solution comes in the form of a reference standard or framework for the long-term preservation of digital information, rather than any kind of application. Therefore, OAIS is a recommendation developed by and intended for a scientific population of engineers, physicists and computer scientists, for whom the challenge was not technological in nature, but rather conceptual, i.e., how to structure and integrate the processes of an electronic archiving system.

The OAIS text is organized into six sections: Introduction, Concepts, Responsibilities, Model, Perspectives of Preservation and Interoperability. The text also includes six appendices.

Purpose and scope

As defined by the document itself:

An OAIS is an archive consisting of an organization, which may form part

9 Brian Lavoie, The Open Archival Information System Reference Model: Introductory Guide, 3.

10 http://public.ccsds.org/publications/archive/650x0m2.pdf [Dated consulted: 16 de enero de 2015]

of a larger organization, persons and systems in charge of preserving information and making it accessible to a designated community.[11] (P.1-1)

This reference model:

- provides a framework for growing understanding and awareness of the archival concepts needed for the preservation and access of long-term digital information;
- provides the concepts necessary for non-archive organizations to be effective participants in preservation processes;
- provides a framework, including terminology and concepts, to describe and compare existing and future architectures and file operations;
- provides a framework for describing and comparing different long-term preservation strategies and techniques;
- provides the basis for comparing data models of the digital information preserved in archives and for discussing how data models and underlying information can change over time;
- provides a framework that can subsequently be expanded to cover the long-term preservation of non-digital information (e.g., physical media or samples);
- Expands consensus regarding components and processes for the preservation and long-term access of digital information, and promotes a larger market that vendors can support;
- guides the identification and production of standards related to OAIS.

The reference model addresses a wide range of digital information preservation functions including data entry, installation, data management, access and dissemination. It also deals with the migration of digital information to new media and forms, the data models used to represent information, the role of software in preserving information, and the exchange of digital information among archives. Identifies internal and external interfaces to file functions, and identifies a number of high-level services on those interfaces. The model provides several illustrative examples and an array of good practice recommendations, while defining a minimum set of requirements for an archive to be deemed an OAIS, and

11 Designated Community is defined in the model glossary as: "An identified group of potential Consumers who should be able to understand a particular set of information. The Designated Community may be composed of multiple user communities. A designated community is defined by the archive and can change over time." The specific subset of information is what the model calls the knowledge base, defined in the model as: "A set of information, incorporated by a person or system that allows that person or system to understand received information."

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 227-253.

a maximum archive in order to provide a broad set of useful terms and concepts. (pp. 1-1 and 1-2)

Defined in its own terms, it is essentially a conceptual model of necessary knowledge for the task of preservation. It is a descriptive framework that allows of comparison present and future architectures, models, strategies, techniques and preservation operations; and includes all types of information in all types of supports and formats. The model promotes consensus regarding the permanent preservation and production of other standards that develop the model itself and complement it.

Since it is a model created by companies in response to their specific needs of preservation and long-term access to aerospace data. It can be applied to any repository, specifically in those organizations with responsibilities to keep the information accessible in the long term. It is also of interest to those organizations and individuals who produce information that must be preserved in the long term, as well as to those who need to obtain it from those archives.

Conceptual basis of OAIS

The model assumes that it is more difficult to preserve information digitally that committed to paper or film supports, because the associated technology is dogged by obsolescence which poses information loss hazards. The model treats this as an organizational, legal, industrial, scientific and cultural issue, not merely a technological one, warning that ignoring the problems posed by the preservation of information in digital form would lead inevitably to its loss.

The model empowers the archive, understood as a variety of functions and systems of storage and preservation, to achieve its objectives while overcoming the problem of the obsolescence of digital information and minimizing costs.

The purpose is to preserve the content information, and to do so in a way comprehensible to the designated community. As such the information must be represented in line with the knowledge base of that community. This entails harmonizing the access tools with the knowledge of the users, without losing sight of how this knowledge evolves.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

Preservation is embodied in what is known as the information package, which brings together the content of the information and the description of the preservation description information, in order to ensure that the content is identified and the environment in which it was created can be understood. Both content and description are encapsulated, linked and identified by the packaging information and made accessible through descriptive information, consisting of a simple heading or a complete set of cataloging attributes. In sum, content is the object of preservation. The content, in turn, is accompanied by a series of metadata, thereby establishing the information package needed for its retrieval and use.

The information package comes in three variants representing as many states or versions of a document:

1. Submission Information Package (SIP), which is the original object transferred by the producer to the archive under the terms agreed by the two parties.
2. Archival Information Package (AIP) in which a SIP is transformed for preservation. It is an object stored in the archive.
3. Dissemination Information Package (DIP) is the object provided in response to a request from the user.

There are three distinct states of the document, or information: the information that enters, the information archived and the information disseminated.

The archive operates within and interacts with a three-part environment (see Figure 1). These parts are producer, management and consumer. The relationships with the producer are based on the submission agreement, which identifies the packages, the timing of shipments, and it materializes with the data submission sessions, in accord with the data models negotiated between the parties. Management refers to the fact that OAIS is part of a broader policy domain, which it constitutes, and for which it institutes governance, objectives and financing, where the designated community (consumers who are presumed to be capable of understanding preserved information) are the central factor. This includes issues such as reference, catalogues, searches, applications, etc. These three parts entail a series of mandatory responsibilities for OAIS (page 3-1), including:

1. Negotiates with the producer and accepts information.
2. Gain sufficient control over the information it archives.
3. Determine who makes up the designated community.
4. Ensure that the information is understandable in itself.
5. Follow established policies and procedures to ensure that it pre serves information against all reasonable contingencies.
6. Make information visible and available to its designated communities.

The model

The model has three components: the functional model, the information model and the information packaging transformations

·*The functional model (pp. 4-1 to 4-20)*

The functional model is repeated each time the subject is addressed, as shown in *Figure 1*. It is easy to understand, but this hides a certain complexity, since each of the entities comprising it has a specific functional development and its corresponding graphic representation:

As described above, producer, consumer and management constitute the environment in which an OAIS operates and interacts. The functional entities are:

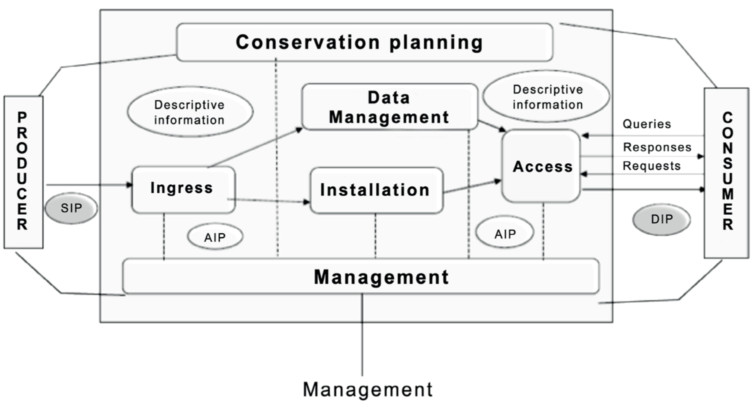


Figura 1. OAIS. Entidades funcionales. Fuente: autores a partir del original

- Ingest Functional Entity provides the services and functions to accept information transfer packages from producers (SIP) and prepare the contents for management and storage in the archive. For each SIP the input function implies a string that begins with reception, whose quality is assured, from which an information file package (AIP) is generated, described and transferred to the functional entity facility.
- The Archival Storage Functional Entity deals with the storage, maintenance and retrieval of the AIP, which entails receiving a storage request and an AIP, conveying it to permanent storage in the archive, managing the storage hierarchy, replacing the media as warranted, checking errors, duplicating contents and storing them in a separate installation for retrieval in the event of catastrophe, and providing data to the functional entity access to fulfill requests.
- Data Management Functional Entity provides the services and functions for completing, maintaining and accessing descriptive information, which identifies and documents the collection in an archive, as well as the administrative data used to manage the archive. It includes database managing and upkeep, receiving and answering queries, and generating reports.
- Administration Functional Entity deals with OAIS global operations. It includes negotiating transfer agreements, managing system configuration, updating archival information, controlling physical access, setting rules and policies, auditing transfers, activating requests and maintaining customer service.
- Preservation Planning Functional Entity monitors the OAIS environment, provides recommendations and preservation plans to ensure that stored information remains accessible and understandable for the designated community in the long term, even after the original computer environment were to become obsolete. The functions of this entity include targeted community and technology monitoring, development of preservation strategies and standards, packaging designs and migration plans.
- Access Functional Entity helps consumers determine the existence, description, location and accessibility of information stored in the OAIS, allowing them to request and receive information products. It includes coordinating access activities, generating information dissemination packages (DIPs), and responding to requests.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

In addition to these functional entities, several Common Services (pp. 4-3 through 4-5) are presumably available that constitute another functional entity in the model. Briefly these services are as follows:

- Operating system services: These provide the core services needed to operate and manage the application platform and provide an interface between the application software and the platform.
- Network services: These provide the capacities and mechanisms to support distributed applications requiring data access, and the interoperability of applications in heterogeneous network environments.
- Security services: These provide capacities and mechanisms to protect sensitive information and associated treatment of data in the information system.

The information model *(pp. 4-20 to 4-49)*

This model describes the types of information in an OAIS and defines the specific information objects that are used to preserve and access the information entrusted to the archive. It is designed to aid future OAIS system architects or designers, and are concepts not directly applicable in practice. Schematically, this service is structured in three parts as follows:

- Logical model for archival information: This model defines the types of information objects (the data with associated representation) required in an OAIS in order to enable long-term preservation of information and effective access to it by the designated community. Such objects include information content, packaging information, and description.
- Logical model of information in an OAIS: This model uses the descriptions of information objects to model the conceptual structures of information necessary to carry out the functions of an OAIS. It aims to highlight the relationship between the types of information needed in the archival process and comprises the three variants of information packages, which are the conceptual structure supporting long-term preservation: transfer, archiving and dissemination. The file information units, which are like information atoms that the archive must store; their descriptions and the collections of archival information and associated descriptions are entailed in this model.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

- Management information: All information needed for the operations of an archive could be stored in databases as persistent data classes. Archive Administration Information represents the full range of information necessary for the day-to-day operation of the archive. Without entailing a comprehensive relationship, this information includes information policy, request tracking, security, subscriptions, user profiles, preservation history, statistics, and accounting information.

Transformations of the information package *(pp. 4-50 to 4-55)*

If the model has so far dealt with functional and architecture, the purpose of this subsection is the subsequent operation followed by the information package and its associated objects from the producer to the archive and from the archive to the consumer. This cycle breaks down as follows:

- Transformations of data in the producing entity. Producer data is private and may be in the format it wishes; however, when the decisions is made to install such data in an OAIS, the producer responsible for the data reaches enters into a transfer agreement with the archivists. This agreement defines issues such as the content, format and expected arrival times of the information transfer packages (SIP).
- Data transformations in the ingest functional area. Once the SIP are in the OAIS, their form and content can be changed, in fact, they become AIP and package descriptors that can be accepted and stored by the installation and data management functional entities, in a process of variable complexity. Moreover, the ingest functional entity will sort the incoming information objects and determine the collections to which they belong, while also updating the descriptions and providing additional access information. It shall coordinate updates and recovery of glitches occurring between data management and installation.
- Transformations of data in the functional areas of installation and data management. The installation functional entity takes the ingest AIP and places it in the permanent archive. The data management entity takes the descriptions and augments them.
- Data flows and transformations in the access functional area. When a consumer wishes to use OAIS data, a description instrument can be used to locate the information of interest. Once the

desired information is located, the consumer makes a request, which, if accepted, gives triggers the access response of providing copies in a temporary storage space.

Perspectives of preservation and interoperability

OAIS's long-term preservation objective faces several daunting challenges associated with and ever-changing computer industry, the short-lived nature of electronic storage media, problems with software itself, and changes in the knowledge base of the designated community.

Among the possibilities available, the proposed strategy is based on migration, because it improves profitability, facilitates adaptation to new technologies and prevents deterioration of the media. However, migration takes time, entails costs and exposes OAIS to a greater risk of information loss.

Without recommending any single one over the others, the model analyzes the pros and cons the diverse types of migration (refreshment, replication, repackaging and transformation). In terms of preserving stable access and use services, the model recognizes the importance of respecting users' familiarity with interfaces, something that is often ignored.

It contemplates both the possibility of an OAIS existing in more than one geographic location and cooperation among diverse archives. Therefore, it considers the points of view of the users wishing to have common services; that of the producers with respect to unified operations, the viewpoint of administrators who value uniformity and quality; as well as matters associated with the interests of archive, such as cost reduction, user satisfaction, and competitiveness.

The model analyzes four possibilities from the perspective of interoperability: absence of interoperability (independent archive), cooperation, federation and shared resources; as well as from the functional point of view, rather than from a technological point of view. As in other sections, it does not prejudge any choice.Further Developments

So far (February 2014) OAIS has led to the development of tools focusing on the ingest functional entity that help materialize the model and:

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 227-253.

- Producer-Archive Interface Methodology Abstract Standard (PAIMAS).[12] This is a CCSDS recommended standard that identifies and provides a framework for interactions taking place between an information producer and a archive. It covers the early stages of the OAIS-defined entry process, with the aim of providing a standardized method for formally defining digital information objects to be transferred from an information producer to an archive and for the effective packaging of those objects in the form of SIP, which supports the effective transfer and validation of the data.
- (XFDU) Structure and construction rules[13] is a CCSDS recommended standard for data and metadata packaging, including software, in an individual package (e.g., a file or a message) to facilitate the transfer and the information file. Another of its purposes is to offer detailed specification of the central packaging structures and mechanisms that comply with the current CCSDS recommendations.
- Producer Archive Interface Specification (PAIS) developed by the CCSDS is a recommended standard issued February 2014[14] and implemented by PAIMAS, for the purpose of providing a standardized method for modeling data to be transferred from an information producer to an archive and subsequent validation by the latter.

Moreover, previous CCSDS developments have been incorporated and adapted to the OAIS philosophy. These standards include the Data Description Language-EAST Specification, the Data Entity Dictionary Specification Language (DEDSL), the Audit and Certification of Trustworthy Digital Repositories (2011) [15] (ISO 16363: 2012), Requirements for Bodies Providing Audit and Certification of Candidate Trustworthy Digital Repositories (2014) [16] and Reference Architecture for Space Information Management (2013) [17] Other products have also adapted to the same philosophy, such as the PREMIS Data Dictionary for Preservation Metadata.

12 http://public.ccsds.org/sites/cwe/rids/Lists/CCSDS%206511R1/Attachments/651x1r1.pdf [Date consulted: 16 de enero de 2015]
13 http://public.ccsds.org/publications/archive/661x0b1.pdf [Date consulted: January 16, 2015]
14 http://public.ccsds.org/publications/archive/651x1b1.pdf [Fecha de consulta: January 16, 2015]
15 http://public.ccsds.org/publications/archive/652x0m1.pdf [Date consulted: January 16, 2015]
16 http://public.ccsds.org/publications/archive/652x1m2.pdf [Date consulted: January 16, 2015]
17 http://public.ccsds.org/publications/archive/312x0g1.pdf [Date consulted: January 16, 2015]

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

There are reasonable doubts about the degree of correlation between those who claim to have understood and implemented the model (from institutions dedicated to the preservation of the digital heritage to software manufacturers) and those who actually have done so, since it is not an application and the standards and tools to implement and measure performance are still in the pipeline. Moreover, many authors invoke it like a mantra, but few have pointed outs its limitations. Still some have tried to state what OAIS is and what it is not, without prejudicing its validity.

OAIS is a conceptualization of the environment, functional components and information objects associated with a system designed for effective, long-term preservation of digital materials.[18] OAIS is an important step towards standardization in the field of digital preservation, "including the development of criteria and procedures for analyzing and evaluating archival preservation and dissemination practices."[19]

The practicality of OAIS as a high-level model with which to frame the structural organization of a repository has been proven. The conceptual framework serves as an independent model of community and technology, defining the essential components of a repository, including the people and automated systems needed to manage long-term digital content and make it accessible to the user community. As an abstract model it confers significant flexibility to system designers in their repositories, allowing them to use in a relevant way regardless of the field of knowledge and content of the repository.[20]

Among the advantages of the model is that it has encouraged the participation of the digital preservation community[21] in the development of standards and application tools, whose common purpose is to find ways to implement an abstract model without forfeiting qualities of universality and standardization.[22] Early on the report *Trusted Digital Repository: Roles and*

18 Brian Lavoie, The Open Archival…, 14.
19 Neil Schumann y Andreas Recker, "De-mystifying OAIS compliance: Benefits and challenges of mapping the OAIS reference model to the GESIS Data Archive", 6.
20 Gareth Knight y Mark Hedges, "Modelling OAIS Compliance for Disaggregated Preservation Services", 63.
21 Especially archivists, librarians, conservationists, experts and companies in the technological and administrative public sector
22 Nancy McGovern, "Aligning National Approaches to Digital Preservation: an Introduction"

Investigación Bibliotecológica, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 227-253.

Responsibilities[23] sought to support implementation of the model by identifying prerequisites to be fulfilled by an organization. Both works define an integrative context for digital preservation, for the first time emphasizing the organizational and technological aspects associated with the management of digital preservation.

In 2003, OAIS working groups produced the Producer-Archive Interface - Methodology Abstract Standard (PAIMAS), which three years later would be earn approval under ISO 20652: 2006. This focuses on detailing the relationship between the producer transferring the digital content and the archive assuming the duty of preserving it, providing the workflow for negotiating and coordinating transfers.

Another important point of collaborative development has been in the area of metadata, when in 2005 *Working Group on Preservation Metadata: Implementation Strategies* (PREMIS)of the OCLC / RLG published the first version of the well-known Preservation Metadata Dictionary known by the acronym of the group. [24]

In 2007, as a result of the efforts of an international group working through the technical committee of the ISO TC20 / SC13, the report *Trustworthy Repositories Audit & Certification* (TRAC: *Criteria and Checklist* was produced. Other certifications in this vein include *Digital Repository Audit Method Based on Risk Assessment* (DRAMBORA), a tool developed by the *Digital Curation Centre and Digital Preservation Europe* (DPE), a methodology for digital repositories administrators, to perform self-assessment of risks in the preservation activity, and the German project Nestor.

As already mentioned, OAIS is not an application and consequently does not prescribe any single architecture, technology or database design; hence the difficulty in verifying the suitability of an archive with the model: it also accounts for the origin of most of the criticisms directed at the same, i.e., the impossibility of adapting to an abstract model. Brian F. Lavoie, an early and insightful analyst, pointed out the ambiguity of OAIS compliance: "Because the reference model is a conceptual framework, rather than a concrete implementation, the meaning 'pursuant to OAIS' is necessarily vague. Compliance with the reference model may imply an explicit application of OAIS concepts,

23 Research Libraries Group (RLG) y Online Computer Library Center (OCLC), Trusted Digital Repositories: Attributes and Responsibilities.
24 PREMIS Editorial Committee, PREMIS Data Dictionary for Preservation Metadata.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 227-253.

terminology, and functional and informational models in the course of developing the system architecture and the data model of a digital repository. It can also mean; however, that OAIS concepts and models are 'recoverable' from implementation. In other words from a high level perspective, it is possible to assign the diverse components in the archive system with the corresponding elements of the reference model. More ambiguity is introduced when institutions and organizations claim compliance with OAIS without defining or clarifying what that means with respect to their particular implementations.[25] A point of view with which practically all scholars have agreed from the beginning[26] which has turned into a sort of critical consensus about the use of the model as a commonplace, slogan or label; and we are referring to its use, not to the value of the model itself. In other words, complying with OAIS necessarily entails implementing a set of requirements that need to be translated, interpreted and fulfilled.

The issue of conformity is usually linked to institutional self-portraits of digital files and computer package descriptions. Despite the influence of the model (or perhaps because of it) and the ubiquity of its terminology and concepts, we often find misconceptions as to what OAIS is and what it is for. These misconceptions reveal fundamental misinterpretation of what is a reference model is.[27] This leads to the cloud of confusion sometimes surrounding the reference model. In our opinion, the fact that the model has been published as an ISO standard serves to expand its prestige, largely because we are accustomed to the ISO issuing prescriptive technical and organizational standards intended for application, but not abstract models. This was a mistake that could be righted only through the progressive development of a normative body oriented to practical application.

> The question inevitably arises to what extent is OAIS applicable? Of course in a literal sense, it is not directly applicable, since it is not a list of requirements that can be checked off as an archive system is constructed. It is, rather, a series of functions and conditions that must be fulfilled, regardless of how. As such, it is impossible to certify, because in that sense it lacks the features of other ISO standards. However, with regard to the mandatory responsibilities described in the

25 Brian Lavoie, The Open Archival…

26 Hilary Beedham et al., Assessment of UKDA and TNA Compliance with OAIS AND METS Standards.

27 Neil Schumann, Andreas Recker (2012). De-mystifying OAIS compliance: Benefits and challenges of mapping the OAIS reference model to the GESIS Data Archive. IASSIST Quarterly , p. 6.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

> model (section 3-1), "it would be difficult for any working archive not to comply with them."[28] For all this, "to speak of implementation of OAIS is misleading. While details of this may seem objectionable, it is important to understand that the OAIS reference model is not transferable to the real world as such, and that this has an impact on the notion of OAIS compliance as posed in the model. As such, OAIS must be conveyed and interpreted by the archive or preservation service provider."[29]

However, it is not appropriate to generalize, since on the other pan of the scale we find abundant examples of proper understanding and judicious use of the reference model. Among these we can cite *Cultural, Artistic and Scientific Knowledge for Preservation and Access and Retrieval*)[30] (CASPAR) funded by the EU under the 6th Framework Program, which was based on the OAIS Model for packaging, access and security management, digital rights management and digital information access; the *Electronic Records Archives* (ERA),[31] whose philosophy tracks with the OAIS model; the SHERPA project, a disaggregated model to provide preservation services to small institutional repositories,[32] or the SHAMAN project (*Sustaining Heritage Access through Multivalent Archives*) for a system of long-term digital preservation in a grid environment.[33] These efforts do not indent or state full conformity.

For some authors, the OAIS model and some of its subsequent developments, such as DRAMBORA, work within --not so much outside of-- traditional systems. ISO 16363: 2012 *(Space data and information transfer systems -- Audit and certification of trustworthy digital repositories)* is based on OAIS and its revision has moved in parallel. The DRAMBORA risk assessment method provides a catalogue of typical risks inherent to digital preservation environments. Both were developed specifically for traditional digital preservation scenarios:

> Its focuses on providing a system to address the problem of digital preservation as a whole. This makes it difficult to apply in non-traditional digital preservation configurations. These models provide guidance on compliance criteria to be met, but do not provide effective governance and control mechanisms, or clear guidance on how to improve an organization's processes associated with digital

28 Hilary Beedham et al., Assessment of UKDA…, 10.
29 Neil Schumann y Andreas Recker, "De-mystifying OAIS…", 7.
30 http://www.casparpreserves.eu/index.html [Dated consulted: January 16, 2015]
31 http://www.archives.gov/records-mgmt/era/ [Dated consulted: January 16, 2015]
32 Gareth Knight y Mark Hedges, "Modelling OAIS Compliance…", 71.
33 Jorg Brunsmann, Long-term Preservation of Product Lifecycle Metadata in OAIS Archives.

preservation. However, digital preservation is increasingly a concern in non-traditional settings, where the organization's environment may not be suitable for the use of an OAIS-based digital preservation system, but instead requires the incorporation of digital preservation skills with existing processes and capabilities associated with the organizational and technological system in place.[34]

A key issue in digital preservation is the fact that long-term conservation must be realized and guaranteed by technologies that are, by nature, short-term and changing. Additionally, it entails components of security and risk management that often are overlooked. Also, the complexity of long-term digital preservation increases by the fact that each activity type and organization has its own particularities and special requirements. This makes it a process that his highly dependent on the environment. Legacy institutions adopting the OAIS reference model have experience in the preservation of tangible objects for a certain number of years, but this experience may not be suitable for organizations faced with emerging digital preservation needs, such as industrial design or e-science companies, where the problem is to develop systems in which digital preservation is a relevant property and life cycle a key element. One way to understand the implications of the context of a digital object is to analyze life cycle. OAIS is limited to the file, which may be insufficient in terms of the additional information needed to preserve the object. "A broader concept of the life cycle of the object is needed, so that all the knowledge necessary for the reuse of objects in the future will be retained."[35]

In this sense, [36] OAIS provides only a very high level, narrow view of the main functions of a *Trustworthy Digital Repository (TDR).* On the other hand, it does prescribe a type of architectural solution that does not necessarily fit the technological horizon of an organization. Even when it does not stand in opposition, the description of a quasi-monolithic, separate system for digital preservation complicates the concept of incremental addition of capabilities and components to an existing system, such as an *Enterprise Content Management System* (ECMS), in order to facilitate preservation. In short, this is a question of scalability.

OAIS is difficult to reconcile where other systems are in operation with

34 Christoph Becker et al., "A Capability Model for Digital Preservation Analyzing Concerns, Drivers, Constraints, Capabilities and Maturities", 1. (Traducción propia.)

35 Gonçalo Antunes, José Barateiro y José Borbinha, "A reference architecture for digital preservation", 229 ss.

36 Christoph Becker et al., "Modeling Digital Preservation Capabilities in Enterprise Architecture".

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

which it can be piggybacked to perform digital preservation tasks and processes. This can occur in organizations with electronic document management systems (EMS) and with key models such as Moreq2010, which covers a broad spectrum of aspects across hundreds of requirements.[37] MoReq2010 is an important catalogue of functional requirements for an electronic document management system (EMS), which covers aspects ranging from classification, audit trail, backup, recovery and security, reference, search and retrieval of information. "It is much more grounded in formal modeling than OAIS, but its hundreds of requirement statements make it too unwieldy and complex. Additionally, it not only covers the essential digital preservation capability of an ERMS, but also the full range of its functionality, providing exhaustive details on the desired operation of specific components of an ERMS."[38]

Although an ECM system is compatible with and can be compliant with OAIS, and these models are in fact complementary, these architectures differ in several essential aspects,[39] which are summarized in an integrated model in the organization (ECM), as opposed to a non-integrated model (OAIS):

- The data entry function in an ECM collects all the content that an organization produces, whereas the OAIS entry function needs to be provided with the information to be preserved.
- ECMs are usually embedded in the organizational infrastructure, while OAIS are often outside organizations that assume responsibility for preserving the information that other organizations have produced.
- Data capture (ECM) collects metadata on ownership, access rights, and other information needed for the active part of the document lifecycle. Ingest (OAIS) specializes in preservation-related metadata, such as, for example, file formats, representational metadata and preservation.
- In an OAIS, the descriptive information is kept separate from the actual data, representing the information to be preserved.
- ECM does not provide preservation planning (an aspect widely discussed by Becker et al.),[40] but rather a continuous functional, or controlled, logical preservation.

37 Christoph Becker et al., "A Capability Model…", 2.
38 Christoph Becker et al., "Modeling Digital…", 85.
39 Joachim Korb y Stephan Strodl, "Digital Preservation for Enterprise Content: A Gap-Analysis between ECM and OAIS"; Stephano Cavagliero, "Digital Archiving Systems Confronted with the OAIS Reference Model".
40 Christoph Becker et al., "Systematic planning for digital preservation: Evaluating potential strategies and building preservation plans".

INVESTIGACIÓN BIBLIOTECOLÓGICA, 30 (69), May/August, 2016, México, ISSN: 0187-358X, 227-253.

OAIS does not provide specific implementation guidance; therefore, intermediate specifications and models are needed to build an OAIS-based system.[41] To accomplish this, some authors point to the need for a reference architecture that provides such practical guidance

> To establish the minimum, mandatory requirements for policies, processes and metadata to measure and validate the reliability of the repository in terms of authenticity, integrity, reproduction, meaning and retrieval of preserved digital materials ... it is not a matter of specifying a particular way of implementing OAIS: it is more about the general implementation guidelines needed if the term "OAIS compliant" is to be taken as a valid indicator that an archive's digital preservation system attains and maintains an adequate or improved degree of operational reliability, consistency and long-term compatibility, which, moreover, is measurable, verifiable, manageable and reasonably future-proof.[42]

There is also no shortage of voices questioning the application of OAIS in certain systems. Thus, in the Preserving Virtual Worlds (PVW) project, devoted to preservation of computer games and interactive fiction, part of the effort was focused on creating compliant OAIS archive information packages (AIP) and placing them in preservation repositories operated by Stanford University libraries and the central library of the University of Illinois at Champaign-Urbana. The greatest difficulties are with the concept of information representation, because it is not the same to address a designated community possessed of a compact knowledge base, such as the scientific community to which OAIS was originally targeted, than the broad, fluid, heterogeneous general public. The information on file formats or contextual information requires institutions to cooperate in order to avoid duplication of effort and enjoy savings. Additionally, it is an extraordinarily complex task to preserve games such as Spacewar! (1962) and Second Life (2003) which depend on long-gone systems and programs.

This experience has even led to reticence to adopt OAIS in the general library area, since it is a standard developed by the space data community, later adopted by the library community with little mind to the fact that scientific data files and research libraries have missions and modes of operation that are quite unique.[43]

41 Luigi Briguglio, Carlo Meghini y C. David Giaretta, "Best Practices for an OAIS Implementation"; Al Egger, "Shortcomings of the Reference Model for an Open Archival Information System (OAIS)".

42 Dennis Nicholson y Milena Dobreva, "Beyond OAIS: towards a reliable and consistent digital preservation implementation framework", 1.

43 James McDonough, "'Knee-Deep in the Data': Practical Problems in Applying the OAIS Reference Model to the Preservation of Computer Games", 1625.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

Finally, economic sustainability, so often minimized in the analysis of digital preservation, is a determining factor for the future of OAIS. This is especially important to organizations operating in competitive environments that absorb costs of such efforts.[44]

Conclusions

In conclusion, OAIS is a reference model, a recommendation to be followed for the design and implementation of an archival system for long-term preservation. It is also a self-explanatory conceptual and terminological model, allowing communication between systems, designers and managers adopting the model. It is not a toolbox, nor is it an application, and much less simply technology: It involves aligning organizational policy and legal, industrial, scientific and cultural requirements.

This has been a decisive step in the standardization of digital preservation, a field with a remarkable degree of dispersion, and it embodies a success story in terms of the wide acceptance it has had in all areas.

It has exerted considerable influence, but it is not the only reference available for proposed digital preservation projects. The criteria catalogues for authentication of repositories specify the requirements that a repository must meet to be reliable. These criteria include levels of technical and organizational responsibility, which are often difficult to assess. Likewise, the archive community has developed criteria and models to support archival projects in their quest for security in the authenticity and provenance of their collections.[45]

Perhaps the future success of OAIS lies in keeping it flexibility, breadth and abstraction. These features have been key in its success so far, and in a remarkable way, earning it an undisputed reputation as a standard model. Moreover, the need to implement it has given rise to a body of standards and developments that enjoy general consensus, and which reinforce the construction of a standardization framework digital preservation requires. Additionally, it is compatible and provides room for the creation of sub-models (e.g., ECM) adapted to diverse preservation environments.

44 Annemieke de Jong, Beth Delaney y Daniel Steinmeier, OAIS Compliant Preservation Workflows in an AV Archive. A requirements Project.
45 Grehory Hunter, Custody of Digital Records…

Reference

Almost all references are available online. We have refrained from providing links since these often expire. The reader can access sources using a search engine.

Antunes, Gonzalo, José Barateiro y José Borbinha. "A reference architecture for digital preservation", en *Proceedings iPRES2010. 7th International Conference on Preservation of Digital Objects,* 229-237. Viena: iPRES, 2010.

Becker, Christoph, Hannes Kulovits, Mark Guttenbrunner, Stephan Strodl, Andreas Rauber, Hans Hofman. "Systematic planning for digital preservation: Evaluating potential strategies and building preservation plans", *International Journal on Digital Libraries* 10 (2009) (4):133-157.

Gonçalo Antunes, José Barateiro y Ricardo Vieira. "A Capability Model for Digital Preservation Analyzing Concerns, Drivers, Constraints, Capabilities and Maturities", en *Proceedings of the iPRES 2011 8th International Conference on Preservation of Digital Objects*. Singapur: Singapur iPRES, 2011.

Gonçalo Antunes, José Barateiro, Ricardo Vieira y José Borbinha. "Modeling Digital Preservation Capabilities in Enterprise Architecture". *The Proceedings of the 12th Annual International Conference on Digital Government Research,* 84-93. Maryland: University of Marylenad, 2011.

Beedham, Hilary, Julie Missen, Matt Palmer y Raivo Ruusalepp. *Assessment of UKDA and TNA Compliance with OAIS AND METS Standards*. London: JISC, UK Data Archive, University of Essex, 2005.

Bellinger, Meg. "Understanding Digital Preservation: A Report from OCLC", en *The State of Digital Preservation: An International Perspective,* 38-48. Washington: Council on Library and Information Resources, 2002.

Briguglio, Luigi, Carlo Meghini y David Giaretta. "Best Practices for an OAIS Implementation", *ERCIM News, special theme: Digital Preservation* 80 (2010): 36-37.

Brunsmann, Jorg. "Long-term Preservation of Product Lifecycle Metadata in OAIS Archives". Tesis de grado, Fakultat fur Mathematik und Informatik der FernUniversitat in Hagen, La Haya: FernUniversitat in Hagen, 2012.

Cavagliero, Stephano. "Digital Archiving Systems Confronted with the OAIS Reference Model", en *Proceedings of The Memory of the World in the Digital Age: Digitization and Preservation. An international conference on permanent access to digital documentary heritage,* 451-456. Vancouver: UNESCO, 2012.

CCSDS. *XML Formatted Data Unit (XFDU) Structure and Construction Rules. Recom-*

mended Standard, issue 1. Blue Book. Washington: CCSDS, 2008.

Audit and Certification of Trustworthy Digital Repositories. Recommended Practice, issue 1. Magenta Book. Washington: CCSDS, 2001.

Producer-Archive Interface Methodology Abstract Standard (PAIMAS). Recommended Practice, issue 1. Red Book. Washington: CCSDS, 2012.

Reference Model for an Open Archival Information System (OAIS). Recommended Practice, issue 2. Magenta Book. Washington: CCSDS, 2012.

Reference Architecture for Space Information Management. Informational Report, issue 1. Green Book. Washington: CCSDS, 2013.

Producer Archive Interface Specification (PAIS). Recommended Standard, issue 1. Blue Book. Washington: CCSDS, 2014.

Requirements for Bodies Providing Audit and Certification of Candidate Trustworthy Digital Repositories. Recomended Practice, issue 2. Magenta Book. Washington: CCSDS, 2014.

CRL y OCLC. *Trustworthy Repositories Audit & Certification (TRAC): Criteria and Checklist.* Dublin (OH.): CRL, OCLC, 2007.

Egger, Al. "Shortcomings of the Reference Model for an Open Archival Information System (OAIS)", *TCDL Bulletin Current* 2 (2006) (2).

Hunter, Gregory S. *Custody of Digital Records: Options and Implementation Considerations.* Prepared for the South Carolina Department of Archives and History. CRM Hunter Information Management Services, Inc., 2006.

ISO 14721:2003 Space data and information transfer systems -- Open archival information system -- Reference model. International Standards Organization. Ginebra: ISO, 2003.

ISO 20652:2006 Space data and information transfer systems -- Producer-archive interface -- Methodology abstract standard. International Standards Organization. Ginebra: ISO, 2006.

ISO 13527:2010 Space data and information transfer systems -- XML formatted data unit (XFDU) structure and construction rules. International Standards Organization. Ginebra: ISO, 2010.

ISO 16363:2012 Space data and information transfer systems -- Audit and certification of trustworthy digital repositories. International Standards Organization. Ginebra: ISO, 2012.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

Jong, Annemieke de, Beth Delaney y Daniel Steinmeier. *OAIS Compliant Preservation Workflows in an AV Archive. A requirements Project.* Amsterdam: Netherlands Institute for Sound and Vision, 2013.

Klump, Jens. "Criteria for the Trustworthiness of Data Centres", *D-Lib Magazine* 17 (1/2).

Knight, Gareth y Mark Hedges. "Modelling OAIS Compliance for Disaggregated Preservation Services", *The International Journal of Digital Curation* 1 (2007) (2): 62-72.

Korb, Joachim y Stephan Strodl. "Digital Preservation for Enterprise Content: A Gap-Analysis Between ECM and OAIS", en *iPRES 2010 Proceedings of the 7th International Conference on Preservation of Digital Objects*, 221-228. Vienna, Österreichische Computer Gesellschaft, 2010.

Lavoie, Brian. *The Open Archival Information System Reference Model: Introductory Guide.* Dublin (OH.): OCLC Online Computer Library Center, Inc. and Digital Preservation Coalition, 2004.

Lee, Christopher A. "Defining Digital Preservation Work: A Case Study of the Development of the Reference Model for an Open Archival Information System". Tesis doctoral, Michigan: University of Michigan, 2005.

"Open Archival Information System (OAIS) Reference Model", en *Encyclopedia of Library and Information Sciences, Third Edition*, Marcia J. Bates y Mary Niles Maack (ed.), 4020-4030. Boca Raton, (FL.): CRC Press, 2009.

McDonough, J. "'Knee-Deep in the Data': Practical Problems in Applying the OAIS Reference Model to the Preservation of Computer Games", en *45th Hawaii International Conference on System Sciences,* 1625-1634. Maui (HI): IEEE Computer Society, 2012.

McGovern, Nancy. "Aligning National Approaches to Digital Preservation: an Introduction", en *Aligning National Approaches to Digital Preservation,* N. McGovern (Volume editor) y K. Skinner (Series editor), 5-16. Atlanta (GE): USA; Educopia Institute Publications, 2012.

Nicholson, Dennis y Milena Dobreva. "Beyond OAIS: towards a reliable and consistent digital preservation implementation framework", en *16th International Conference on Digital Signal Processing (DSP 2009)*, Santorini, Greece, julio 5-7, 2009.

Oßwald, Achim. "Das Referenzmodell. OAIS – Open Archival Information System", en *nestor Handbuch: Eine kleine Enzyklopädie der digitalen Langzeitarchivierung. Version 2.3.,* Heike Neuroth, Achim Oßwald, Regine Scheffel, Stefan Strathmann y K. Huth. Gotinga: nestor, 2010.

PREMIS Editorial Committee, *PREMIS Data Dictionary for Preservation Metadata, version 2.2.* Washington: Library of Congress, 2012.

Research Libraries Group (RLG) y Online Computer Library Center (OCLC). *Trusted Digital Repositories: Attributes and Responsibilities.* Mountain View (CA): RLG, 2002.

Ruusalepp, Raivo, C. A. Lee, B. van der Werf y M. Woollard. "Standards Alignment", en *Aligning National Approaches to Digital Preservation,* N. McGovern (Volume editor), 115-166. Atlanta (GE): Educopia Institute Publications, 2012.

Schumann, Neil y Andreas Recker. "De-mystifying OAIS compliance: Benefits and challenges of mapping the OAIS reference model to the GESIS Data Archive", *IASSIST Quarterly* (2012): 6-11.

Para citar este artículo:

Cruz-Mundet, José Ramón y Carmen Díez-Carrera. 2016. "Sistema de Información de Archivo Abierto (OAIS): luces y sombras de un modelo de referencia." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 227-253. http://dx.doi.org/10.1016/j.ibbai.2016.10.010

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.010

Análise de regularidades metodológicas em pesquisas brasileiras sobre comportamentos de uso e usuários da informação

Hamilton Rodrigues Tabosa *
Virgínia Bentes Pinto
José Mauro Matheus Loureiro **

Artículo recibido:
27 de noviembre de 2013.
Artículo aceptado:
13 de octubre de 2015.

Resumo

Objetiva investigar as contribuições de pesquisadores brasileiros, dentro dos estudos de uso e usuários da informação, a partir da análise de vinte e duas dissertações e quatro teses, no que se refere a metodologias empregadas nesses estudos e seus principais resultados na última década. Identifica regularidades nas metodologias frequentemente utilizadas e analisa indícios de padronização metodológica nessa área de investigação da Ciência da Informação (CI), bem como aglutina e analisa os principais resultados dessas pesquisas que,

* Universidade Federal do Ceará, Brasil. (hrtabosa@gmail.com); (bentespinto@yahoo.com.br)
** Universidade Federal do Estado do Rio de Janeiro, Brasil. jmmloureiro@gmail.com

consequentemente, colaboram para a construção teórica e metodológica na CI. Apresenta conceitos de metodologia e aspectos da construção metodológica da Ciência da Informação como uma Ciência Social. Os resultados indicam coerência nas escolhas metodológicas dos trabalhos investigados, bem como apontam regularidades na adoção de métodos e técnicas oriundas das Ciências Sociais, tais como preferência por pesquisas qualitativas, uso de entrevistas, questionários, estudos de caso, entre outros. Os resultados apresentam também haver regularidades quanto a certas conclusões a que chegaram as dissertações e teses a respeito dos comportamentos de busca e uso de informação.

Palavras-chave: Ciência da Informação – metodologia; Ciência da Informação – pesquisa; Comportamentos de busca e uso da informação; Estudo de usuários.

Abstract

Analysis of methodological regularity in Brazilian research on information user behaviors

Hamilton Rodrigues-Tabosa, Virgínia Bentes-Pinto and *José-Mauro Matheus-Loureiro*

This paper examines the contributions of Brazilian researchers in the field of information use and users, through an analysis of methodologies employed in twenty-two research paper and four theses published in the last decade, while also examining their results. By identifying the frequency of the methodological approaches employed, we attempt to find evidence of methodological standardization in the field of Information Science (IS) research. Moreover, by gathering the results of these surveys, our aim is to facilitate the methodological and theoretical construction of IS. This paper introduces the concept of methodology and methodological aspects of the construction of Information Science as a social science. Results indicate consistency in methodological choices of the sample works and regularities in the adoption of methods and techniques habitually employed in the social sciences, such as the preference for qualitative research, use of interviews, questionnaires and case studies. Moreover, the research finds regularities in certain conclusions regarding the thesis regarding search behavior and use of information.

Keywords: Information Science – methodology; Information Science – research; Seeking behaviors and use of information; Study users.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

Introdução

O estudo das necessidades de informação, dos comportamentos de busca e dos usos da informação das pessoas individualmente ou de um determinado grupo social pode ser considerado como um método de investigação científica de um fenômeno social que a Ciência da Informação (CI) denomina estudos de uso e usuários da informação. Identificados por Araújo (2009) como corrente teórica da CI, os estudos de uso e usuários apresentam uma perspectiva cognitivista, buscando entender a informação a partir das estruturas mentais dos usuários que se relacionam com a informação (que necessitam que buscam e que a usam). Conforme esse autor, esses estudos partem das percepções dos usuários em relação às suas necessidades de informação, os caminhos percorridos para saciar essas necessidades e o uso da informação para a execução de determinada tarefa ou para solucionar um problema.

A literatura em CI aponta na direção da carência de padronização metodológica nas pesquisas da área, tendo importado muitas abordagens, modelos e técnicas das ciências humanas e sociais, isso depois de ela própria ter começado a procurar se afastar do positivismo (muito embora em certos casos o viés positivista ainda permaneça), passando a transpor gradativamente o paradigma físico, e passado a se esforçar para se reconhecer como ciência social e começado a acumular conhecimentos que, posteirormente, viriam a consolidar suas próprias teorias e métodos. Para González de Gómez (2007), essa pluralidade metodológica é própria das ciências sociais e interdisciplinares como a CI.

Pinheiro (2005) destaca que, no Brasil, os estudos de cunho teórico, metodológico e epistemológico na área de CI, acompanham o cenário internacional no que se refere ao baixo número de publicações, se comparado a outras áreas de especialidades dentro da CI, o que torna interessantes e necessárias iniciativas de investigações teóricas nessa área. No Brasil, existem hoje vários pesquisadores que se debruçam sobre essa corrente teórica da CI que diz respeito ao estudo dos comportamentos de busca e uso da informação.

Este estudo constitui-se de uma análise das contribuições de pesquisadores brasileiros, dentro do escopo dos estudos de uso e usuários da informação, a partir da análise de dissertações e teses, no que se refere a metodologias empregadas nesses estudos e seus principais resultados na última década. Com isso, objetivamos identificar regularidades nas metodologias predominantemente utilizadas e analisar os avanços teóricos e indícios de padronização metodológica nessa área de investigação da CI no Brasil, bem como aglutinar e analisar os principais resultados dessas pesquisas que, consequentemente, colaboram para a construção teórica e metodológica na CI.

Para o desenvolvimento deste estudo, foram selecionados vinte e seis relatórios de pesquisa, sendo vinte e duas dissertações e quatro teses, defendidas em programas de pós-graduação em CI no Brasil a partir de 2000, por meio de consultas à Biblioteca Digital Brasileira de Teses e Dissertações (BDTD)[1] e nos repositórios institucionais das universidades onde funcionam cursos de pós-graduação em nível de mestrado e/ou doutorado.

O corpus documental para o estudo foi selecionado por meio da utilização do campo de busca avançada presente nas interfaces dos bancos de dados, e que respondeu a estratégias de buscas com os operadores *booleanos* "e" e "ou", ou equivalentes, empregados para ligar os termos "necessidade", "informação", "uso", "usuários" e "comportamento", que aparecessem no resumo das dissertações ou teses, para identificar pesquisas que tivessem como temática principal os estudos sobre comportamentos de busca e uso da informação.

Foi criada uma planilha para consolidar os dados e facilitar a leitura a partir das categorias: autor, tipo de trabalho (dissertação ou tese), objetivo geral, metodologia e resultados. O objetivo geral de cada trabalho foi transcrito fielmente na coluna correspondente, porém, na coluna que coube à determinação da metodologia, foram usados termos e expressões resumidas para indicar a escolha metodológica do pesquisador, com relação ao método, tipo de pesquisa quanto aos objetivos (exploratória, descritiva, dentre outros), natureza (qualitativa, quantitativa, etc.), técnica de coleta de dados (entrevistas, questionários e sua tipologia, etc.), técnica de análise de dados (análise do discurso, análise de conteúdo, etc.), e assim por diante. Também foi feita a transcrição de trechos retirados do resumo e/ou do capítulo destinado à análise dos dados e/ou da conclusão de cada trabalho, para identificar os principais resultados alcançados por cada pesquisa, no intuito de se traçar um panorama das contribuições dos pesquisadores brasileiros no que diz respeito à construção do conhecimento científico em CI.

1 http://bdtd.ibict.br/

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, septiembre/diciembre, 2016, México, ISSN: 0187-358X, pp. 255-273

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

Metodologia: o estudo do método

A finalidade da pesquisa científica é descobrir respostas para questões mediante a aplicação de métodos científicos. Embora esses métodos nem sempre sejam capazes de gerar respostas absolutamente irrefutáveis, dadas suas características e limitações, muitas vezes são os únicos que podem oferecer resultados satisfatórios e/ou razoavelmente confiáveis, conforme Lakatos e Marconi (1996).

Ainda segundo esses autores, a Metodologia objetiva identificar e analisar os aspectos distintivos dos vários métodos imprescindíveis a uma investigação, avaliar seu alcance, suas potencialidades, seus limites ou capacidade de causar distorções e criticar os pressupostos ou aquilo que sua utilização pode acarretar. É na Metodologia que são traçadas com precisão, minúcia e rigor todas as ações desenvolvidas no método (caminho) do trabalho de pesquisa. É o detalhamento da tipologia da pesquisa, da sua instrumentalização, do tempo previsto para sua execução, do *staff* e da divisão das tarefas, embora muitas vezes o pesquisador trabalhe sozinho, das técnicas escolhidas para o tratamento quantitativo, qualitativo ou misto dos dados, ou seja, de todo o material empregado nas diferentes etapas da pesquisa e do passo a passo que o pesquisador percorreu, de modo que a pesquisa possa ser reproduzida por outro pesquisador.

Richardson (1999) preceitua que os pensadores Francis Bacon e René Descartes foram os que mais se destacaram no desenvolvimento de um método geral de conhecimento e continua: "o método científico é um conjunto de regras para observar fenômenos e inferir conclusões" (1999: 22). Segundo Lakatos e Marconi (1996), o método é o somatório das atividades sistemáticas e racionais que, promovendo maior segurança e economia, permite se atingir o objetivo da pesquisa gerando conhecimentos válidos e verdadeiros, traçando o caminho a ser percorrido ou que escolhas devem ser feitas, detectando equívocos e inexatidões e auxiliando a tomada de decisão dos cientistas.

Considerando que o ato de classificar exige a demarcação de algum parâmetro, os tipos de pesquisa são classificados de acordo com critérios empregados pelos metodólogos. Sem a intenção de elencar todas as possibilidades de classificação, destacamos abaixo algumas principais classificações de pesquisa encontradas na literatura e que foram utilizadas para a instrumentalização do estudo desenvolvido neste artigo:

- Quanto à natureza (Silva, 2004):
  - Pesquisa Básica - objetiva gerar conhecimentos novos úteis para o avanço da ciência sem aplicação prática prevista. Envolve verdades e interesses universais.

- Pesquisa Aplicada - objetiva gerar conhecimentos para aplicação prática dirigida à solução de problemas específicos. Envolve verdades e interesses locais.

* Quanto à forma de abordagem (Gil, 1996):
  - Pesquisa Quantitativa - considera que tudo pode ser quantificável, o que significa traduzir em números opiniões e informações para classificá-los e analisá-los.
  - Pesquisa Qualitativa - considera que há uma relação dinâmica entre o mundo real e o sujeito, isto é, um vínculo indissociável entre o mundo objetivo e a subjetividade do sujeito que não pode ser traduzido em números. A interpretação dos fenômenos e a atribuição de significados são básicos no processo de pesquisa qualitativa.
* Quanto aos objetivos (Gil, 1996):
  - Pesquisa Exploratória - visa proporcionar maior familiaridade com o problema com vistas a torná-lo explícito ou a construir hipóteses. Envolve levantamento bibliográfico; entrevistas com pessoas que tiveram experiências práticas com o problema pesquisado; análise de exemplos que estimulem a compreensão. Assume, em geral, as formas de Pesquisas Bibliográficas e Estudos de caso.
  - Pesquisa Descritiva - visa descrever as características de determinada população ou fenômeno ou o estabelecimento de relações entre variáveis. Envolvem o uso de técnicas padronizadas de coleta de dados: questionário e observação sistemática. Assume, em geral, a forma de Levantamento.
  - Pesquisa Explicativa - visa identificar os fatores que determinam ou contribuem para a ocorrência dos fenômenos. Aprofunda o conhecimento da realidade porque explica a razão, o "porquê" das coisas. Quando realizada nas ciências naturais requer o uso do método experimental e nas ciências sociais requer o uso do método observacional. Assume, em geral, a formas de Pesquisa Experimental e Pesquisa *Ex-post-facto.*
* Quanto aos procedimentos técnicos (Silva, 2004):
  - Pesquisa Bibliográfica - quando elaborada a partir de material já publicado, constituído principalmente de livros, artigos de periódicos, etc.
  - Pesquisa Documental - quando elaborada a partir de materiais que não receberam tratamento analítico.
  - Pesquisa Experimental - quando se determina um objeto de estudo, selecionam-se as variáveis que seriam capazes de influenciá-lo, definem-se as formas de controle e de observação dos efeitos que a variável produz no objeto.

- Levantamento - quando a pesquisa envolve a interrogação direta das pessoas cujo comportamento se deseja conhecer.
- Estudo de caso - quando envolve o estudo profundo e exaustivo de um ou poucos objetos de maneira que se permita o seu amplo e detalhado conhecimento.
- Pesquisa Ex-Post-Facto - quando o "experimento" se realiza depois dos fatos.
- Pesquisa ação - quando concebida e realizada em estreita associação com uma ação ou com a resolução de um problema coletivo.
- Pesquisa Participante - quando se desenvolve a partir da interação entre pesquisadores e membros das situações investigadas.

Destacamos que alguns dos tipos de pesquisa identificados acima não são excludentes e podem ser empregados em consórcio, de maneira complementar, a critério do pesquisador, para melhor compreensão do seu objeto de estudo.

A construção metodológica em Ciência da Informação: uma Ciência Social

Considerando a gênese formal da CI ligada às ciências exatas, sobretudo à Ciência da Computação e aos modelos explicativos da transmissão e recuperação da informação por máquina, com a Teoria Matemática da Comunicação, no final do século XX ela passou a se esforçar para se inscrever efetivamente dentre as Ciências Sociais (CS) (Araújo, 2003), afastando-se daqueles posicionamentos inicias baseados no empirismo e tecnicismo positivistas, vindo a assentar-se, de fato, como CS na década de 80 (Linares Columbié, 2010).

Richardson (1999) explorando o pensamento de Georgen, afirma que a pesquisa no campo das Ciências Sociais não pode negligenciar a reflexão sobre o contexto conceitual, histórico e social que forma o horizonte mais amplo dentro do qual as pesquisas isoladas obtêm o seu sentido. A partir desse argumento, a CI passou então a incorporar em seus estudos os aspectos sociais, culturais e históricos envolvidos nos processos de informação, desvencilhando-se do paradigma físico e abrindo espaço para o cognitivo e depois o social, como assevera Capurro (2003).

A Ciência pode ser dividida em Formal e Factual, estando a CI entre as factuais, conforme ensinam Lakatos e Marconi (1996), uma vez que ela estuda fatos (objetos empíricos, coisas e processos) que, reconstruídos pelo olhar do pesquisador, precisam ser analisados com o intuito de se refutar ou comprovar hipóteses, em sua maioria, provisórias.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, septiembre/diciembre, 2016, México, ISSN: 0187-358X, pp. 255-273

Para a construção do conhecimento científico, as CS utilizam metodologias quantitativas ou qualitativas, constituídas de inúmeros métodos, conforme vimos na seção anterior, métodos esses que a CI absorveu e que vêm sendo utilizados pelos pesquisadores da área.

Para Silva (2008), a CI, nos primeiros momentos da sua migração para o campo das CS, utilizou-se de métodos quantitativos e teria assumido uma postura de pretensa imparcialidade (resquício do positivismo), porém, na maioria de seus estudos, não teria logrado êxito quanto a essa neutralidade. Segundo esse autor, essa fase foi vencida pela adoção de ideias marxistas, de modo que o fazer científico passou a ser questionado e novos elementos foram sendo agregados à análise dos objetos de estudo. Como havia afirmado Richardson (1999), a historicidade, os aspectos e fenômenos sociais despertaram o interesse da CI, bem como a "compreensão da tensionalidade constante nas relações de luta de poder expandem uma teoria crítica sobre diversos aspectos das práticas na área" (Silva, 2008: 67). No entanto, Araújo (2003: 25) enfatiza que "É, apenas com a aproximação junto ao 'terceiro ramo' das ciências sociais, isto é, aos enfoques microssociológicos e interpretativos, que a Ciência da Informação vai conhecer uma reformulação mais profunda de seus pressupostos, que vai alterar sobretudo o significado do que é entendido como 'informação'".

Dentre as principais correntes teóricas desenvolvidas nesse "terceiro ramo" das CS, Silva (2008) destaca a Sociologia Interpretativa de Weber e o enfoque microssociológico de Simmel e identifica o Interacionismo Simbólico, a Fenomenologia e Etnometodologia como fontes de importantes contribuições à evolução da CI. A partir de então, a CI abriu-se a novas tendências no fazer científico da área da informação, como ressalta Araújo (2003).

Buscando sempre nas CS os métodos científicos para instrumentalizar seus estudos, a CI não teria desenvolvido seus próprios métodos de pesquisa, principalmente nos campos de investigação onde a subjetividade é mais latente, como por exemplo, os estudos de uso e usuários da informação. Assim, os pesquisadores da CI perceberam que levantamentos e aplicação de métodos estatísticos não eram suficientes para explicar a realidade e os fenômenos culturais e sociais envolvidos nesse tipo de pesquisa e passaram a buscar outros meios de instrumentalizar seus estudos.

Bettiol, na década de 1990, afirmava: "As descobertas no campo [dos estudos de uso e usuários] têm sido de difícil aplicação, ao que se atribui, frequentemente, à falta de uma teoria unificada, de uma metodologia padronizada e de definições comuns" (1990: 61). Case, já em 2007, ou seja, quase duas décadas depois, frisou que a falta de uma delimitação teórica continua a prejudicar a investigação empírica sobre busca de informações e sobre os

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

comportamentos do usuário. González de Gómez (2000) ainda amplia essa noção de carência de padronização metodológica na CI, quando reforça o argumento de que toda a pesquisa nessa área, não se limitando ao âmbito dos estudos de uso e usuários da informação, não possui uma metodologia própria, devendo o pesquisador cuidar da adequação das estratégias metodológicas empregadas por ele à problemática do estudo em questão, já que, segundo a autora, a CI apresenta-se, desde seu início, como conjunto de saberes agregados antes por questões do que por teorias.

Esse estado teórico e metodológico incipiente se explica pelo fato de que, conforme já mencionado anteriormente, o positivismo predominou na CI por muitos anos, desde seu surgimento no início do século XX (considerando suas raízes na Documentação, criada por Otlet e La Fontaine), sendo suplantado somente no final daquele século, pelo advento do paradigma cognitivo e social vivenciado pela CI, conforme explica Capurro (2003), bem como por uma aparente ausência de identidade da CI, tendo surgido de uma teoria matemática e depois migrado para as CS, afirmando-se interdisciplinar tendo, no entanto, sua própria epistemologia ainda em discussão e inconclusa, conforme afirma Linares Columbié (2010).

A denominação Ciência da Informação surgiu somente em meados do século XX, mas somente na década de 90 é que alguns de seus princípios, teorias e métodos passaram a ser consolidados, como aponta Pinheiro (2005). Durante esse período de "amadurecimento", a CI passou por três fases de evolução, conforme a autora, e enfrentou os três paradigmas identificados por Capurro (2003).

Assim, o padigma cogtivivo, já na segunda metade do século XX, trouxe à baila outras preocupações para a CI, que passou a investigar o sujeito, o usuário da informação, suas necessidades, comportamentos de busca e uso da informação, superando o modelo de gestão custodial dos acervos. Podemos afirmar que os estudos nessa área são relativamente recentes e seus produtos intelectuais ainda incipientes, pela falta de delimitação consistente de suas metodologias e teorias (ou quase teorias, como ressalva Pinheiro (2005)) em que se acentam. É evidente que não se pode negligenciar a necessidade de um amadurecimento lento e gradual de uma ciência em busca de identidade, que ainda empreende esforços para melhor compreender e mesmo conceitualizar seu objeto de estudo. Devemos considerar também a subjetividade e a inescapável necessidade de abstração inerentes aos estudos de informação e, especialmente, de usuários da informação, seres sociais de difícil apreensão devido sua essência carregada de instabilidade.

Por essas razões, evidentemente, nas CS não se pode aplicar as mesmas metodologias utilizadas nas ciências naturais. Daí a importância de se investigar regularides nas construções metodológicas das pesquisas em CI, de modo que possamos identificar e avaliar sua consistência.

Alguns aspectos da Ciência da Informação no Brasil

Conforme destaca Pinheiro (2005), os estudos de cunho teórico, metodológico e epistemológico na área de CI são escassos também no Brasil, devido aos cursos de pós-graduação no País terem começado e permanecido na área de Biblioteconomia, tendo alterado sua denominação para CI somente a partir da década de 90, além do que, o único programa que inclui uma linha de pesquisa sobre Epistemologia ser o Programa de Pós-Graduação em Ciência da Informação do IBICT. Quanto a linhas de pesquisa onde se enquadram estudos de comportamentos de busca, acesso, uso e usuários da informação, existem vários programas de pós-gradução que se dedicam a essa área de estudo no Brasil.

Assim como aconteceu com a própria denominação da área da CI e a consolidação de terminologias ao longo de suas três fases de evolução, conforme Pinheiro (2005), os estudos de uso e usuários da informação foram sofrendo mudanças de abordagem desde seu surgimento na segunda metade do século XX, tendo começado com estudos dos sistemas de informação, passando depois a investigar o indivíduo e, mais recentemente, o uso da informação. Essa área da CI vem, aos poucos, acumulando conhecimentos, o que torna investigações nessa área desejáveis e necessárias, visando à aglomeração de conhecimentos que possam subsidiar a consolidação de um corpo teórico e metodológico. Na atualidade, há vários pesquisadores empenhados em estudos de uso e usuários da informação no Brasil, cujas contribuições giram em torno de investigações sobre os comportamentos de busca, desenvolvimento de metodologias para os estudos de uso e usuários da informação ou sobre o uso feito de um determinado tipo de informação por grupos de pessoas ou comunidades específicas.

Análise das construções metodológicas em dissertações e teses em Ciência da Informação no Brasil

Antes de apresentarmos os dados quantitativos e interpretá-los, faz-se oportuno refletirmos sobre a elevada diferença entre o número de dissertações (vinte e duas) e teses (quatro) identificadas e selecionadas para este estudo. É importante notar que os estudos de uso e usuários da informação, enquanto corrente teórica da CI, como assevera Araújo (2009), não esteja despertando tanto interesse de doutorandos no Brasil, da mesma forma como acontece com os mestrandos. A questão que se coloca é: se houve tantos mestrandos desenvolvendo pesquisas dessa natureza, por que essa proporção não se reflete no doutorado?[2] Ou seja, por qual motivo os mestres parecem não continuar seus estudos no doutorado a partir dos projetos que desenvolveram no mestrado? Essa realidade pode acarretar que não sejam realizados estudos nessa área com maior grau de complexidade e comprometer o surgimento de conhecimentos inéditos nesse ramo de investigação. Esse quadro tende a não favorecer o desenvolvimento da Ciência da Informação e, certamente, jamais colocará o Brasil na posição de vanguarda na produção de conhecimentos nessa área, restando-nos apenas a opção de assimilação, reprodução e adaptação de métodos, técnicas e teorias que não foram desenvolvidos a partir da nossa realidade, e que, provavelmente, não necessariamente se adequarão a nossas idiossincrasias, como tem acontecido ao longo do tempo, com a importação das leis, regras e códigos que regem o desenvolvimento de quadros teóricos e pragmáticos do profissional da informação no Brasil.

Nossa preocupação encontra fundamento quando observamos a classificação dos vinte e seis trabalhos analisados: quatorze se autoclassificaram como sendo de natureza qualitativa, nove como sendo quali-quantitativos e seis, ou seja, vinte e um por cento como sendo de natureza quantitativa. Isso se refletiu também na quantidade de estudos identificados pelos próprios pesquisadores como descritivos, representando trinta e um por cento do total (exploratórios, vinte e sete por cento, enquanto os exploratórios e descritivos representaram quarenta e dois por cento do total) (*Figura 1* e *Figura 2*).

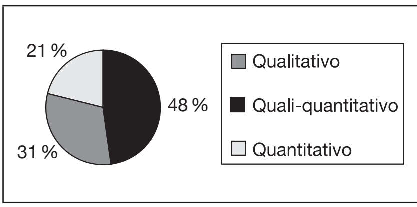


Figura 1. Quanto à forma de abordagem

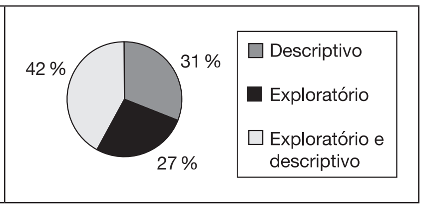


Figura 2. Quanto a os objetivos

Mesmo considerando as diferentes abordagens e as diferentes variáveis que podem interferir no modo como se trabalha um determinado objeto de estudo, causou-nos admiração o fato de não haver sequer uma dissertação ou tese que tenha sido classificada quanto aos objetivos, como explicativa.

2 Naturalmente, admitimos o fato de não haver tantas vagas em cursos de doutorado como há nos de mestrado, porém, o que destacamos aqui é a diferença na proporção.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

Como vimos anteriormente, são as pesquisas explicativas que aprofundam o conhecimento da realidade, uma vez que explicam suas razões, suas causas. Outro ponto digno de nota é o fato de haver um percentual de pesquisas, que julgamos elevado, com foco apenas no aspecto quantitativo das realidades estudadas, ou apenas com o objetivo de levantar dados estatísticos e descrever uma realidade ou situação.

Assim, parece que parte dos pesquisadores em CI no Brasil estão sempre "explorando" temas e assuntos ainda pouco ou nunca estudados ou limitando-se a descrever a realidade, sem se preocupar com suas causas, em investigar mais profundamente as questões.

As escolhas metodológicas para coleta e tratamento dos dados feitas pelos mestrandos e doutorandos para estudar quantitativamente os que coletaram giraram em torno de questionários estruturados e uso de software capazes de realizar cálculos estatísticos, como o SPSS, EndNote, Ucinet e Excel, fundamentando suas escolhas na facilidade de tabulação, visualização de proporções, discrepâncias e geração de gráficos.

Com relação às pesquisas de natureza qualitativa, essas apresentaram maior pluralidade metodológica no que diz respeito às técnicas de coleta e análise dos dados. Nessa categoria, destacaram-se como recorrentes as técnicas de coleta de dados: entrevista semiestruturada, entrevista estruturada ou semiestruturada associada à aplicação da técnica do incidente crítico,[3] o questionário com perguntas fechadas e com perguntas abertas e fechadas, bem como a aplicação conjunta de questionário e entrevista semiestruturada.

Para o desenvolvimento de pesquisas de caráter qualitativo, essas escolhas pareceram-nos adequadas, pois possibilitam, por exemplo, no caso das entrevistas semiestruturadas, um maior aprofundamento das questões propostas por meio da interação face a face, retomada de pontos que não tenham sido bem esclarecidos, e pela possibilidade de percepção dos gestos e fisionomias dos sujeitos. Já quanto aos questionários, é sabido que as perguntas abertas ensejam respostas subjetivas que somente através de uma análise qualitativa é possível se atribuir sentido.

Dentro da categoria de pesquisas qualitativas, chamou-nos atenção o fato de haver também a aplicação de modelos clássicos de comportamento de busca e uso de informação como o proposto por Dervin[4] (utilizado em dois

3 Técnica criada pelo psicólogo americano John C. Flanagan. Essa técnica tem sido aplicada tanto em campos das Ciências Sociais como na Saúde, Educação e Informação e que consiste em pedir ao entrevistado que, nesse caso, descreva a última ocasião em que necessitou de um determinado tipo de informação. Ver Flanagan (1954).

4 A abordagem Sense-Making foi desenvolvida pela economista e pesquisadora estadunidense Brenda Dervin (1983) tendo tido, desde então, vasta aplicabilidade no campo da Comunicação Social e da Ciência da Informação.

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

trabalhos), o de Wilson (1996) (utilizado em um) e o de Ellis[5] (utilizado também em um). Esses modelos foram empregados para estudar realidades distintas, tendo sido corroborada sua eficiência e atualidade.

A técnica de análise dos dados das investigações de natureza qualitativa ou quali-quantitativa mais empregada foi a análise de conteúdo,[6] aparecendo em segundo lugar a análise do discurso,[7] como meios para se extrair sentido da subjetividade própria das respostas das questões abertas dos questionários e das transcrições dos depoimentos gravados das entrevistas. Pudemos verificar que em dezesseis por cento dos casos o autor da pesquisa disse apenas que realizou uma análise qualitativa dos dados coletados, ou que os dados qualitativos foram analisados "manualmente", no intuito de esclarecer que não foi utilizado nenhum software para trabalhar os dados, mas sem qualquer indicação da técnica de análise de dados aplicada.

A metodologia qualitativa não permite generalizações. Considera-se mais importante a descrição dos fenômenos em situação real, do que a extensão da amostragem. Não existem verdades absolutas e sim, as opiniões daqueles que participaram da coleta de dados, não negligenciando o fato de que agem sob subjetividades, enquanto o pesquisador é também um ser subjetivo. Ainda assim, os resultados de investigações qualitativas contribuem diretamente para uma melhor compreensão da realidade.

Assim, é salutar esclarecer que não é conveniente menosprezar ou subestimar o potencial que uma análise qualitativa de dados tem de promover a compreensão, ou mesmo de explicar uma determinada realidade no mundo. Revelar que foram aplicadas técnicas específicas e que se utilizaram ferramentas sofisticadas, tais como os softwares estatísticos, para dar conta dos dados quantitativos, e afirmar que se empreendeu apenas uma análise "manual" dos dados qualitativos, ou que eles apenas foram lidos para em seguida se dizer, superficialmente, o que se pensa das respostas, é perder metade do esforço de pesquisa, jogando material informacional coletado fora. Não dar a esses dados o tratamento adequado, aplicando em sua análise uma técnica capaz de extrair o máximo de informação relevante, é perda de tempo e de dinheiro. Isso sem considerar a parcialidade, ou mesmo o próprio comprometimento do resultado da investigação.

Observando esses trabalhos que não indicaram claramente a técnica de análise de dados utilizada, notamos que em alguns deles foram realizadas análises de dados baseadas em categorias ou em unidades de

5 O modelo de Ellis (1989) foi ampliado por Ellis, Cox e Hall (1993).
6 Método bastante utilizado nas Ciências Sociais e Humanas, popularizado pela professora de Psicologia Laurence Bardin (2007).
7 Análise do discurso ou análise de discurso é uma prática e um campo da linguística e da comunicação especializado em analisar construções ideológicas presentes em um texto (Rocha e Deusdará, 2005).

análise parecidas com aquelas sugeridas por Bardin, embora não se possa afirmar que tenha sido utilizada, efetivamente, a análise de conteúdo, uma vez que essa opção metodológica não foi claramente descrita na metodologia das pesquisas. Em outros dois casos, foram empregados software para a análise qualitativa dos dados,[8] a saber: QSR[9] e o NVivo2.0.[10]

Quanto aos procedimentos técnicos, o Estudo de Caso foi, definitivamente, o mais utilizado (sessenta e dois por cento), sendo seguindo pela técnica de Estudo de Casos Múltiplos[11] (trinta e oito por cento). Isso pode ser compreendido pelo fato de que estudar comportamentos de busca e uso de informação impele o pesquisador, necessariamente, a delimitar bastante seu recorte de pesquisa, restringindo-o a uma instituição ou a um grupo de pessoas, por exemplo. Essa técnica possibilita a observação aprofundada na medida em que concentra os recursos no caso visado e não está sujeita às restrições ligadas à comparação do caso com outros casos (Gil, 2009) muito embora a comparação seja possível quando se emprega o estudo de caso duplo, triplo ou múltiplo. Os resultados de estudos de caso não podem ser generalizados e lançam luz somente sobre o caso investigado, uma vez que foi estudado em profundidade, considerando peculiaridades locais ou intrínsecas ao objeto de estudo.

Dois trabalhos chamaram nossa atenção pela ousadia de sua escolha metodológica. Os autores empregaram ferramentas desenvolvidas por eles próprios para desenvolver seus estudos e testar resultados: um deles criou uma taxonomia enquanto o outro elaborou um modelo baseado no Paradigma da Difusão de Inovações entre consumidores, de Gatignon e Robertson (1991) e o aplicou para estudar consumidores (usuários) de informação. Ambas as pesquisas apontaram na direção da pertinência de suas inovadoras iniciativas e da relevância dos construtos teóricos desenvolvidos a partir delas. Acreditamos que iniciativas como essas são, além de corajosas, desejáveis e salutares para o crescimento teórico e metodológico da CI, na medida em que partem da inovação, da criação, não se limitando à aplicação de instrumentos e técnicas já consolidados e frequentemente reproduzidos em outras pesquisas.

Tendo identificado e analisado as regularidades existentes no que diz respeito aos percursos metodológicos das dissertações e teses selecionadas para

8 São softwares projetados para auxiliar os pesquisadores a organizar e analisar dados não-numéricos ou não estruturados.

9 Empresa desenvolvedora de software para pesquisa qualitativa com sede em Melbourne, Austrália, com escritórios no Reino Unido e Estados Unidos.

10 Suporta métodos de pesquisa qualitativos e mistos. Permite reunir, organizar e analisar conteúdos de entrevistas, discussões em grupo, pesquisas, áudio, mídias sociais e páginas *web*.

11 Gil (2009) esclarece que o Estudo de Caso pode ser empregado para estudar um ou poucos casos. Com relação aos trabalhos que tiveram como lócus mais de um caso, classificamo-los como Estudo de casos múltiplos.

INVESTIGACIÓN BIBLIOTECOLÓGICA, Vol. 30, Núm. 70, septiembre/diciembre, 2016, México, ISSN: 0187-358X, pp. 255-273

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

compor o corpus documental deste artigo, passamos a descrever e analisar os principais resultados a que chegaram essas pesquisas.

Os resultados dos estudam apontam que, no meio empresarial, o tipo de informação mais importante é o gerencial, por fundamentar as tomadas de decisões dos gestores e atender precisa e rapidamente as necessidades de informação surgidas no dia-a-dia das organizações, favorecendo a solução de problemas em tempo hábil e promovendo vantagens competitivas no mercado. Essa constatação deve orientar as deliberações do profissional da informação no momento da seleção de itens que irão compor os acervos das organizações, bem como no próprio atendimento prestado ao seu público interno, podendo influenciar drasticamente o modo como ele conduz as entrevistas de referência.

Paradoxalmente, as conclusões dos trabalhos analisados revelam inexistirem profissionais da informação atuando nessas organizações, como também nelas não há políticas de informação ou diretrizes formais que orientem os processos, os fluxos, a transferência e a própria gestão da informação. Considerando que os gestores sentem necessidade de se informarem para melhor exercerem suas atribuições, percebendo a informação como insumo para o desenvolvimento e sobrevivência da empresa e como não há profissionais da informação atuando nas organizações, isso nos revela um nicho mercadológico amplo para esse profissional. Há que se investigar as razões pelas quais esses profissionais não estão inseridos nas organizações.

Embora esse não seja o objetivo deste artigo, ousamos arriscar possíveis explicações para esse fato, no intuito de despertar o interesse de outros pesquisadores para o desenvolvimento de estudos futuros. Assim, consideramos que algumas das causas da ausência de profissionais da informação nas organizações perpassem por questões: a) salariais, b) desconhecimento por parte das organizações das potencialidades do bibliotecário, do arquivista ou do documentalista, por exemplo e conforme o caso, c) a habilidade técnica desses profissionais pode não estar voltada para a atuação em unidades de informação com configurações tão peculiares e distintas como as empresariais.

Outra constatação das dissertações e teses estudadas se refere à grande importância dada ao uso de tecnologias para buscar e acessar informação, que modificaram as formas de interação dos usuários com os bancos de dados e interfaces dos sistemas. Os recursos e funcionalidades oferecidos pelos artefatos tecnológicos, cada vez mais atrativos e eficientes, têm transformado o modo como o ser humano acessa e usa informação, seja textual, não-verbal, sonora ou audiovisual. Assim, não surpreende que a internet tenha sido apontada como o meio mais utilizado para se acessar informação. As pessoas estão indo menos às bibliotecas movidas pelo “princípio do menor esforço”

(Figueiredo, 1994), pelo qual o uso de um canal de informação não é utilizado ser for trabalhoso demais e/ou de difícil acesso – o sujeito irá procurar sempre o caminho mais prático, fácil e rápido, optando por perguntar a alguém presente no local, fazer um telefonema, acessar a internet e, em último caso, sair do prédio onde se encontra, preferindo, muitas vezes, simplesmente desistir de obter a informação.

No entanto, quando o sujeito, na busca por informação, resolve perguntar a alguém, as pesquisas indicaram que o maior grau de confiança é dado à informação profissional (médico, advogado, um colega de profissão, professor, entre outros).

O último ponto em comum à maioria dos estudos aqui analisados diz respeito ao compartilhamento da informação. Entenda-se por compartilhamento a divulgação da informação de maneira ampla, como aquela que é utilizada em treinamentos de empregados, para lecionar a estudantes, repassar a amigos e parentes, veicular em meios de comunicação, postar em redes sociais na internet, dentre outras possibilidades. Percebe-se que os sujeitos não se informam pensando exclusivamente em resolver problemas e satisfazer necessidades pessoais, havendo uma forte propensão à solidarização com outras pessoas menos informadas, o que as leva a procurar informação para distribuir.

Conclusão

Com este trabalho de pesquisa, identificamos e analisamos algumas regularidades presentes nos percursos metodológicos adotados nas dissertações e teses sobre comportamentos de busca e uso de informação defendidas em instituições brasileiras na última década e descrevemos e analisamos os principais resultados dessas pesquisas.

Sumarizando as observações que fizemos em nossa análise, elencamos abaixo as escolhas metodológicas tomadas pelos pesquisadores e as principais conclusões a que conseguiram chegar com seus estudos. Não é nosso objetivo afirmar que tais resultados configuram-se como princípios, leis ou teorias, mas somente aglutinar sentenças que esboçam uma "perspectiva de suficiência" no que diz respeito aos percursos metodológicos adotados e uma "perspectiva de verdade" no que se refere ao corolário que se afirma a respeito da realidade, posto de resultam de estudos científicos ao longo de pouco mais de uma década (2010 a 2012). Dito isso, ressaltamos que os construtos teórico-metodológicos no campo da CI, no Brasil, apontam na direção de que:

DOI: http://dx.doi.org/10.1016/j.ibbai.2016.10.011

a) os estudos de comportamentos de busca e uso de informação são mais numerosos nas pesquisas de mestrado que de doutorado;
b) há predominância de pesquisas de caráter qualitativo, sendo seguidas pelas quali-quantitativas;
c) os estudos exploratório-descritivos aparecem com mais frequência e os descritivos em segundo lugar;
d) quanto aos instrumentos de coleta de dados das pesquisas quantitativas, os questionários estruturados são os mais utilizados, havendo o uso de softwares estatísticos para tabulação e análise;
e) quanto aos instrumentos de coleta de dados dos estudos qualitativos foram identificados como sendo de uso frequente os questionários e entrevistas semiestruturadas;
f) como técnica de análise dos dados das pesquisas qualitativas, foram recorrentes a análise de conteúdo e, em segundo lugar, a análise do discurso.
g) o estudo de caso e o estudo de casos múltiplos foram utilizados na grande maioria dos trabalhos;
h) a informação gerencial é a mais importante nas organizações;
i) inexistem políticas, diretrizes, processos e fluxos de informação formalizados nas organizações devido à ausência do profissional da informação;
j) as tecnologias da informação e da comunicação alteraram sobremaneira o modo como interagimos com a informação, como realizamos a busca e como a acessamos,
k) a internet é o meio de acesso à informação mais procurado pelos sujeitos;
l) havendo necessidade de obter informação através da consulta a uma pessoa, a informação fornecida por profissionais (professores, engenheiros, médicos, por exemplo) é dotada de maior confiabilidade, na percepção dos sujeitos das pesquisas;
m) a informação também é buscada e acessada para ser compartilhada e, não necessariamente, apenas para uso pessoal.

Em nossa visão, parece haver coerência nas escolhas metodológicas feitas pelos pesquisadores dos trabalhos analisados. Entendendo a Ciência da Informação como uma ciência social, é aceitável que ela utilize métodos e técnicas advindas das Ciências Sociais, principalmente, sendo de nosso conhecimento que a CI não revelou, ainda, ser capaz de gerar resultados satisfatórios e confiáveis através do emprego de metodologias próprias.

No entanto, a simples reprodução de métodos e técnicas já conhecidos, sendo somente aplicados, por exemplo, em diferentes recortes geográficos, cronológicos, de grupos sociais, faixas etárias ou etnias, apenas contribuirá para o conhecimento limitado da realidade.

Para o avanço das ciências, é primordial estimular a criatividade do pesquisador, de modo que ele possa analisar o mundo por outros meios, de outras formas, por outras "lupas", nem sempre melhores ou piores, mas diferentes. É na diferença que se apresenta a perspectiva do novo, da descoberta, do avanço.

Referências

Araújo, C. A. A. 2003. "A ciência da informação como ciência social". *Ciência da Informação*, Brasília, 32 (3) (set./dez.): 21-27.

—— 2009. "Correntes teóricas da ciência da informação". *Ciência da Informação*, Brasília, 38 (3) (set./dez.): 192-204.

Bardin, Laurence. 2007. *Análise de conteúdo.* Lisboa: Edições 70.

Bettiol, E. M. 1990. "Necessidades de informação: uma revisão". *R. Biblioteconomia de Brasília* 18 (l): 59-69 jan./jun.

Capurro, R. 2003. "Epistemologia e Ciência da Informação". Em *Encontro Nacional De Pesquisa Em Ciência Da Informação, 5*, 2003, Belo Horizonte. *Anais do quinto Encontro Nacional de Pesquisa em Ciência da Informação,* 1-23. Belo Horizonte: ANCIB. Acesso em: 30 jun. 2013, http://www.capurro.de/enancib_p.htm

Case, D. O. 2007. *Looking for information*. 2. ed. Amsterdam: Elsevier.

Dervin, Brenda. 1983. "An overview of Sense-making research: concepts, methods and results to date". *International Communications Association Annual Meeting.* Dallas, May, 1983.

Ellis, D., D. Cox e K. Hall. 1993. "A comparison of the information seeking patterns of researchers in the physical and social sciences". *Journal of Documentation*, London, 49 (4): 356-369.

Ellis, D. 1989. "A behavioral model for information retrieval system design". *Journal of Documentation* 45 (3): 171-212.

Figueiredo, N. M. 1994. *Tópicos modernos em Ciência da Informação.* Lorena: Centro Cultural de Teresa D'ávila.

Flanagan, John C. 1954. "The critical incidental technique". *American Institute for Research and University of Pittsburgh. Psycological Bulletin* 51 (4) (jul.).

Gatignon, H. e T. S. Robertson. 1991. "Innovative decision processes". Em T. S. Robertson e H. H. Kassarjian, *Handbook of consumer behavior*, 316-348. New Jersey: Prentice-Hall.

Gil, A. C. 1996. *Como elaborar projetos de pesquisa.* 3. ed. São Paulo: Atlas.

—— 2009. *Métodos e técnicas de pesquisa social.* São Paulo: Atlas.

González de Gómez, M. N. 2000. "Metodologia de pesquisa no campo da Ciência da Informação". *DataGramaZero-Revista de Ciência*

da Informação 1 (6) (dez.). Acesso em: 15 mar. 2013, http://www.dgz.org.br/dez00/Art_03.htm
—— 2007. "Para una reflexión epistemológica sobre La ciência de La información". *Signo y Pensamiento* 50 (XXVI) (ene.-jun.): 47-61.
Lakatos, E. M. e M. A. Marconi. 1996 *Técnicas de pesquisa: planejamento e execução de pesquisas, amostragens e técnicas de pesquisas, elaboração e interpretação de dados.* 3. ed. São Paulo: Atlas.
Linares Columbié, R. 2010. "Epistemología y ciência de la información: repensando um diálogo oincluso". *Acimed*, Havana, 21 (2). Acesso em: 18 mar. 2012, http://www.acimed.sld.cu/index.php/acimed/article/viewArticle/52/18
Pinheiro, L. V. 2005. "Processo evolutivo e tendências contemporâneas da Ciência da Informação". *Informação & Sociedade: Estudos,* João Pessoa, 15 (1) (jan./jun.): 13-48.
Rabello, R. 2012. "A Ciência da Informação como objeto: epistemologias como lugares de encontro". *Perspectivas em Ciência da Informação* 17 (1) (jan./mar.): 2-36.
Richardson, R. J. 1999. *Pesquisa social: métodos e técnicas.* 3. ed. São Paulo: Atlas.
Rocha, D. e B. Deusdará. 2005. "Análise de Conteúdo e Análise do Discurso: aproximações e afastamentos na (re)construção de uma trajetória". *Alea: Estudos Neolatinos* 7 (2) (jul./dec.): 305-322, Rio de Janeiro.
Silva, C. R. O. 2004. *Metodologia e organização do projeto de pesquisa: guia prático.* http://www.ufop.br/demet/metodologia.pdf Acesso em: 18 mar. 2013.
Silva, M. G. 2008. *Informação e a população carcerária: estudo de usuários de informação na Penitenciária José Maria Alkmim, Ribeirão das Neves – MG.* Dissertação (Mestrado em Ciência da Informação), Universidade Federal de Minas Gerais, Belo Horizonte.
Wilson, T. D. 1996. "Information needs and uses: fifty years of progress?", em *Fifty years of information progress: a Journal of Documentation review*, B. C. Vickery (org.), 15-51. Londres: Association for Information Management. Acesso em: 30 jun. 2013, http://informationr.net/tdw/publ/papers/1994FiftyYears.html

Para citar este artículo:
Rodrigues Tabosa, Hamilton, José Mauro Matheus Loureiro y Virgínia Bentes Pinto. 2016. "Análise de regularidades metodológicas em pesquisas brasileiras sobre comportamentos de uso e usuários da informação." *Investigación Bibliotecológica: Archivonomía, Bibliotecología e Información 70*: 255 -273.
http://dx.doi.org/10.1016/j.ibbai.2016.10.011