relato de pesquisa

BRAZILIAN MODEL OF LIBRARY AND INFORMATION STUDIES IN THE BACHELOR'S LEVEL

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ABSTRACT The article is aimed to improve the academic education in the field of library and information science in Brazil by structuring the curricular reasoning that shapes the contents of undergraduate academic programs. It is the second article of a group of two articles that resulted from a study conducted in Brazil in 2011– 2014. The first article presents a universal model$_1$ of LIS programs (ZINS; SANTOS, 2016, in press). This article presents the Brazilian model$_2$. This part of the research was composed of two methodological phases. The first phase was a systematic Critical Delphi study with 21 leading information science scholars from Brazil. The second phase was an unsystematic formative evaluation of the content categories. The evaluation was based on a Grounded theory study of 13 academic programs in Brazil. The study resulted in a model$_2$ that sets the guiding principles for developing undergraduate programs in Brazil. The model is actually composed of two complementary models; a systematic four step developing process (model$_{2.1}$) and a structured plan of 288 content categories (model$_{2.2}$). The study improves the development and evaluation of LIS programs in Brazil by providing a structured model for content selection. The study stresses the key role of the curricular reasoning for improving LIS education in Brazil; a curricular reasoning that is grounded in the Brazilian milieu.

Keywords: LIS education. Library and information science undergraduate studies. Curiculum development. Content selection.

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1 INTRODUCTION

This study was initiated in October 2011 at the ENANCIB annual conference, which is the main annual library and information science (LIS) meeting in Brazil attended by hundreds of researchers and practitioners. While meeting colleagues they asked to replicate the study *Knowledge Map of Information Science* (ZINS, 2007a, b, c, d), which clarified the various conceptions of the field and mapped its main subfields; this time – in the context of LIS studies in Brazil. The idea was to formulate the basics of LIS education acceptable by all the institutions that offer a bachelor's degree (BA).

The study was expected to be quick and simple, but it turned to be demanding and exhaustive. Initially the objective was to define the basic knowledge and skills that LIS departments in Brazil should teach as part of the requirements of a bachelor's degree. We assumed that all the institutions teach the same basic knowledge and the diversity among them is embodied in the additional courses and programs designed

to meet their specific needs. The assumption is based on guidelines established by the Ministry of Education. The Department of Higher Education at the Ministry of Education appointed in 1998 committees of experts for each of the different fields, among them information science.

The committee for information science formulated guidelines for curricula in library studies, archival studies and museology. The guidelines were officially approved in 2001[1]. The initiative to formulate the guidelines followed the work of the Group Mercosur on Library Education, which was composed of participants from Argentina, Brazil, Chile, Paraguay and Uruguay. The Group established in 1996 the following themes for undergraduate studies: theoretical foundations of library and information science, organization and representation of information, resources and information services, policies and management units, information systems and services, information and communication technologies, and research in library and information science[2] (GUIMARAES, 2002).

In Brazil there are 46 academic institutions that award academic degrees in library and information science in various forms. They are located in the five regions of the country (i.e. north, northeast, central-west, southeast, and south). 46 institutions award the Bachelor of Arts (BA) degree in 73 programs, as follows: 39 programs in library science (LS), 16 programs in archival studies (AS), 14 programs in museum studies (or museology) (MS), and 4 programs in information management (IM). 45 institutions offer classroom programs (CP). One institution, the University of Caxias do Sul, opened in 2012 a distance learning program (DL). Currently it awards an undergraduate degree only in LS. The undergraduate studies are offered by the departments of information science in four areas – LS, AS, MS, and IM – but the "information science" degree per se is awarded only in the graduate level.

LIS graduate institutions offer non-degree continuing professional education for licensed information professionals, and academic degree studies. Two institutions award the Professional Master (PM) degree in LS, AS and IM. The Professional Master is aimed to prepare students for professional careers by focusing on the practical aspects of the information professions. 14 institutions award the *Master of Science (MSc)* degree: 12 in IS, two in MS and one in IM. 13 institutions award the Doctor of Philosophy (PhD) degree: 12 in IS and one in MS (Table 1 summarizes the current state of LIS education in Brazil; for details on each institution see appendix A).

Table 1: LIS education in Brazil

Degree	LS	AS	MS	IM	IS	Programs	Institutions
BA	39	16	14	4		73	46
PM	1	1		1		3	2
MSc			2	1	12	15	14
PhD			1		12	13	13

Own: Source

The research methodology was Critical Delphi with 21 leading scholars from Brazil. During the study we realized that the conditions are far more complicated. The participants had difficulty distinguishing between the current state and the ideal state of LIS education. Their initial positions reflected the triple head dominant structure of the BA studies (i.e. library studies (librarianship), archival studies, and museum studies (museology), the special interests of their academic environments, as well as the tension between the documentation and the technology competing traditions. The inevitable gap between the desired state and the existing state of affairs was striking. Once again it reminded us that academic programs are planned for given communities, bound by given conditions, designed for given students, and aimed to be taught by a given staff. What is basic in central universities is not necessarily basic in peripheral and remote universities, and vice versa. We noticed that most of the responses are grounded in the Brazilian context and if we omit the Brazilian perspective, we uncover

1 See the curriculum guidelines for undergraduate studies in Brazil, the Ministry of Education (http://portal.mec.gov.br/index.php?option=com_content&id=12991&Itemid=866, accessed on September 9, 2014).

2 Mercosur meetings of Managers and Educators of Library Science Graduations (Brazil, 1996; Argentina, 1997; Chile, 1998; Uruguay, 2000; Paraguay, 2001 and Brazil, 2002).

essential positions relevant for LIS studies worldwide.

This insight resulted in revising the initial objectives of the study by adding the universal perspective. Consequently, the study was broadened and ended up in two interrelated and complementary exemplary models, universal and local. The universal $model_1$ sets the guiding principles for developing BA programs applicable to LIS education worldwide (ZINS; SANTOS, in press). The second $model_2$ demonstrates the curricular reasoning by setting the guiding principles for developing academic programs in Brazil and is presented in this article.

The term "model" refers here respectively to the systematic process of program development ($model_{x.1}$) and to the structured scheme, or plan, of contents ($model_{x.2}$). The two meanings stand for two complementary models ($_{x.1\text{-}x.2}$) that are combined into an integrated $model_1$ (universal) (or $model_2$ (Brazilian)); meaning, the systematic process of curriculum development requires grounding the content selection on the structured plan. Throughout the article we use the following terminology: $model_1$ (universal model), $model_{1.1}$ (process), $model_{1.2}$ (plan), and the Brazilian counterparts, $model_2$ (Brazilian model), $model_{2.1}$ (process), $model_{2.2}$[3] (plan)

The universal study ended up with a systematic process of program development and with a structured scheme (or plan) of contents. The systematic process of program development is composed of four successive steps: defining the academic goals, specifying the derived contents, organizing the contents in the structured plan, and evaluating the program. The structured plan is composed of 288 content categories. Both, the four step developing process and the 288 content categories, are studied as they are implemented in the Brazilian context.

2 METHODOLOGY

The scientific methodology is Critical Delphi. Critical Delphi is a scientific method that facilitates critical and reflective series of in-depth structured and moderated peer discussions among experts (the panel) on the various aspects of the discussed issues while confronting their own biases and misjudgments. The panel was composed of 21 participants. Initially, 58 scholars were invited to participate in the study, 27 agreed to receive the first questioner, but only 21 responded, and they form the panel. The 58 researchers were selected from a database using the Lattes Platform and the Brazilian LIS associations.

The Lattes Platform is an information system maintained by the Brazilian Government to manage information on science, technology, and innovation related to individual researchers and institutions working in Brazil. The panel members are officially considered as the most important researchers in information science in the country. They represent the main aspects of LIS studies in Brazil and are affiliated with 11 central and peripheral academic institutions (see appendix B).

The study was composed of three successive rounds of structured questioners. The discussions among the panel members were indirect and anonymous, and were moderated by the researchers. The first questionnaire was submitted to the panel in November 2011. It contained 12 detailed and open-ended questions. The second questionnaire was submitted in March 2012 and contained 23 questions. The third questionnaire was submitted in August 2012 and contained 17 questions (see selected excerpts from the three questionnaires in Appendix C.

The return rates were high: 21 scholars (100%) participated in first round, 18 (85.7%) participated in the second round, 18 (85.7%) participated in the third round and 18 (85.7%) participated in all the three rounds (see Table 2).

3 The subscripts are aimed to clarify the different meanings of "model" in the article. "$Model_1$" stands for the universal model and for an integrated model, which is composed of $model_{1.1}$ and $model_{1.2}$; "$Model_{1.1}$" stands for the systematic development process. "$Model_{1.2}$" stands for the structured plan of contents. "$Model_2$" stands for the Brazilian model and for an integrated model, which is composed of $model_{2.1}$ and $model_{2.2}$; "$Model_{2.1}$" stands for the systematic development process (in Brazil). "$Model_{2.2}$" stands for the structured plan of contents (in Brazil).

Table 2: Statistical details of the study

Panel Selection

First invitation	Accept Invitation	Respond Round 1	Respond Round 1/Accept
58 (100%)	27 (46.5%)	21 (36.2%)	21/27 (77.7%)

Return Rates

Round 1	Round 2	Round 3	Round 1 + 2 + 3
21 (100%)	18 (85.7%)	18 (85.7%)	18 (85.7%)

Questioners

	Round 1	Round 2	Round 3
Submission:	November 7, 2011	March 4, 2012	August 11, 2012
Questions:	12	23	17

Own: Source

After formulating the 288 content categories (ZINS; SANTOS, in press) we decided to exemplify them by fields and courses taken from the panel responses and academic curricula in Brazil. We reviewed 13 programs from 9 universities[4] that award a bachelor's degree; all of them in Portuguese. To enable readers who do not speak Portuguese follow the examples we translated the selected programs and published them online (http://cienciadainformacao.inf.br).

Reviewing the academic programs was not part of the initial research agenda, but eventually it turned to be an invaluable methodological building block that played an important role in shaping the Brazilian model$_2$. In a retrospective, the study was composed of two methodological phases. The first was a systematic Critical Delphi study with 21 leading information science scholars. The second was an unsystematic formative evaluation of the model$_2$, which was based on a Grounded Theory study of academic programs.

3 THE BRAZILIAN MODEL$_2$

An academic program is designed to achieve defined academic goals by providing specific knowledge and develop certain skills. The scope of the knowledge covered by the curriculum is grounded in the conception of the field that sets the boundaries of the knowledge domain. The given conception affects the academic goals that, at a turn, shape the planned contents. The contents are the core of academic programs and the focus of the study. To specify the basic contents of LIS education in Brazil we are required to clarify the dominant conception of information science, which represents the mainstream, define the common academic goals and specify the derived contents.

3.1 Conception of information science in Brazil

Zins (2007a) defined six generic conceptions (or models) of information science; these are the hi-tech model (i.e. encompasses hi-tech), the technology model (i.e., encompasses all types of information technologies), the culture model (i.e., encompasses technological and

4 Federal University of Bahia, archival studies (UFBA-AS) (http://cienciadainformacao.inf.br/documents/19/ufba-a), museum studies (UFBA-MS) (http://cienciadainformacao.inf.br/documents/55/ufba-m); Federal University of Paraná, information management (UFPR-IM) (http://cienciadainformacao.inf.br/documents/51/ufpr-gi); Federal University of Rio Grande do Sul, library sciences and communication (UFGRS-LS) (http://cienciadainformacao.inf.br/documents/2/ufgrs-b), museum studies (UFRGS-MS) (http://cienciadainformacao.inf.br/documents/57/ufrgs-m); Federal University of Santa Maria, archival studies (UFSM-AS) (http://cienciadainformacao.inf.br/documents/20/ufsm-a); Federal University of São Carlos, library science (UFSCAR-LS) (http://cienciadainformacao.inf.br/documents/32/ufscar-b); Federal University of the State of Rio de Janeiro, museum studies (UNIRIO-MS) (http://cienciadainformacao.inf.br/documents/56/unirio-m); Londrina State University, library science (UEL-LS) (http://cienciadainformacao.inf.br/documents/26/uel-b), archival studies (UEL-AS) (http://cienciadainformacao.inf.br/documents/22/uel-b); São Paulo State University, library sciences (UNESP-LS) (http://cienciadainformacao.inf.br/documents/3/unesp-b); University of Brasília, library sciences (UNB-LS) (http://cienciadainformacao.inf.br/documents/4/unb-b), archival studies (UNB-AS) (http://cienciadainformacao.inf.br/documents/18/unb-a).

social aspects), the human world model (i.e., encompasses biological and social aspects), the living world model (i.e., encompasses human and non-human aspects), and the living & physical worlds model (i.e., encompasses all forms of information in the universe).

The six models imply six different bodies of knowledge. Consequently, they establish six different fields of knowledge; all carry the same name, *information science*, and six different LIS BA academic programs. The culture model represents the mainstream of information science academic community as well as the position of the panel in this study. All the institutions that award a bachelor's degree in Brazil accept the culture model[5]. Their programs reflect the culture conception that defines information science as the study of the mediating aspects of data, information, knowledge, and message (D-I-K-M) phenomena as they are implemented in the culture domain, which encompasses the technological, cultural and social aspects.

3.2 Academic goals

The academic goals embody the raison d'être and the guiding principles of the curriculum. They are affected by the social and academic conditions, grounded in the conception of the field, and embodied in the contents and the teaching methods. The social and academic conditions vary in the various environments and lead to different programs in different parts of Brazil as well as the teaching methods. In this study we focus on the common knowledge across the diversified environments. Therefore, we omit the environmental conditions and the teaching methods. We focus on the planned contents while keeping in mind that they need to be consistent with the conception of information science, which was stated above.

In the process of defining the academic goals of a generic LIS program in the Brazilian milieu the panel members were asked to state their visions of LIS education. The following vision seems to represent the LIS academic community worldwide as well as the academic community in Brazil:

> The university should bring together thought and action, theory and practice. It should lead to a process of thinking aiming to develop a critical view, prepare the students to life itself, not just preparing for professional careers. An interdisciplinary approach is essential for such model. (PINHEIRO, 2012, personal communication, October 29)

A bachelor's LIS program should provide students the basic knowledge and skills necessary for being (1) literate (i.e. ability to read and write and study), (2) educated and knowledgeable (i.e., have basic knowledge and skills as academics), be familiar with (3) the basic theoretical and empirical knowledge of information science and (4) the basic theoretical and empirical knowledge of their fields of expertise (specialization), (5) be able to perform basic practices and tasks as information professionals (i.e., have practical knowledge common to all information professionals), and (6) as professionals in their fields of expertise (i.e., have practical knowledge common to all professionals in their specific fields of expertise).

The six elements set six academic goals that must be implemented in courses. The six goals are culminated in four foci – general education (goals 1 and 2), general information science education (goal 3), specialization (goal 4), and professional training (goals 5 and 6) – that turn into four groups of contents.

3.3 Contents

The contents for the Brazilian milieu mirror the contents that were identified and formulated for the universal model$_{1.2}$, with relevant adjustments. LIS programs in Brazil include four content groups: general non-information science contents that are common across fields and categorized as general education (GE), general information science knowledge (GIS) that are core contents common to all the programs, knowledge in the specialized fields of expertise (SP), and practical knowledge (PR) relevant to information professionals. The four content groups are grouped in two main parts, general education (GE) and information science education (GIS, SP, and PR), which set the basic structure of all the BA programs in Brazil, although they are expressed in various forms.

The general education consists of six categories (cat. 1-6). The information science

5 See, for example, the library science program at the São Paulo State University: "The objective of the library science major is to train information professionals to work in a broad range of information units, from traditional public schools and academic libraries to corporate information centers", UNESP-LS, *op. cit*.

education includes the GIS, SP, and PR contents and consists of 30 categories in 10 sections (cat. 7-36). Each of the 36 categories has two levels, basic (B) and advanced (A), which indicate its importance in the eyes of the faculty; a total of 72 categories (see table 3).

Defining the importance of a subject matter, in terms of the scope and intensity of the coverage, is illusive and contextual based. To simplify the definitions we base them in a quantitative criterion – the duration of the suggested courses. The basic level is equivalent to an academic course (i.e., 30 academic hours; an academic hour is 45 minutes). The advanced level is equivalent to two academic courses (i.e., 60 academic hours) or more. The numbers in brackets below, and in Table 3, presents the number of panel members who suggested the listed contents.

The *general education* part covers fields that are not part of information science and we expect that open minded educated knowledgeable graduates will be familiar with. It is composed of six categories. Category 1 encompasses literacy studies[6]. It provides basic knowledge and skills that facilitate learning and social communication; among them languages (Portuguese (5), Spanish (2) and English (7)), communication skills (6), learning skills, computer literacy, Internet literacy, and information literacy (5). Category 2 comprises of humanities; among them art[7] (1), literature[8] (3), philosophy[9] (3), logic[10] (3), linguistics[11] (10), semiotics[12] (4) and mathematics[13]. Category 3 encompasses social sciences, among them anthropology[14] and sociology[15] (5), Brazilian studies[16] (4), economics[17] (1), education[18] (1), history[19] (4), law[20] (1), political science[21] (2), and social psychology[22]. Category 4 encompasses natural sciences (e.g., chemistry, physics and geography). Category 5 encompasses life sciences, such as biology and psychology (3). Generally, courses in natural sciences and life sciences per se are not offered in Brazil. A few universities, though, offer courses in psychology and in environmental sciences (ecology)[23]. Category 6 encompasses technology studies, mainly computer science[24].

The *information science education* part consists of 10 main sections following Zins' (2007a, b, c, d) knowledge map of information science; including foundations, resources, knowledge workers, contents, applications, operations & processes, technologies, environments, organizations, and users. The foundation section encompasses the meta-knowledge of information science. The other sections are grounded in the definition of information science as the study of the mediating conditions of human knowledge. Connecting resources and users involves nine elements: the mediated resource, the knowledge worker who conducts the mediation activity, the mediated content, the application (or purpose), the knowledge/information based operation and process, the utilized technology, the social environment, the organizational setting, and the prospective user.

Each of the sections is further divided into three categories designed to meet the GIS, SP, and PR content groups. The GIS categories (cat. 7, 10,

6 See the courses *writing in Portuguese*, UNESP-LS, *op cit*., 140431 (Portuguese), UNB-LS, *op. cit.*, 6LEM061 (Spanish), UEL-AS, *op. cit.*, LET02268 (English) and LET03320 (methodology of reading), UFGRS-LS, *op. cit.*, BIB02255 (communication), UFRGS-MS, 186163 (communication and negotiation) UNB-AS, *op. cit.*, and SIN167 (information literacy), UFPR-IM, *op. cit*.

7 See courses ART02061 (art), UFGRS-LS, *op. cit.,* EBA 010 (history of Brazilian art), UFBA-MS, *op. cit.*, and the course *history of culture*, UNESP-AS, *op. cit*.

8 See courses 141089 (literary theory) and 14320 (film and literature), UNB-LS, *op. cit*.

9 See courses HUM01861 (philosophical thought), UFRGS-MS, *op. cit*., 137553 (philosophy), UNB-LS, *op. cit*., and HFC0065 (philosophy), UNIRIO-MS, *op. cit*.

10 See courses 137812 (logic), UNB-LS, *op. cit*., FCH004 (logic), UFBA-AS, *op. cit*., and 301078 (logic and database applied to IS), UFSCAR-LS, *op. cit*.

11 See the course 140082 (linguistics), UNB-LS, *op. cit*.

12 See the course SIN136 (semiotic aspects of information), UFPR-IM, *op. cit*.

13 See, for example, course SIN165 (mathematics), UFPR-IM, *op. cit.*

14 See courses 135020 (cultural anthropology), UNB-LS, *op. cit*., HUM05855 (social anthropology), UFGRS-LS, *op. cit.*, and FCH124 (anthropology), UFBA-MS, *op. cit*.

15 See, for example, course HUM 04002 (sociology), UFGRS-LS, *op. cit*., and course 134465 (sociology), UNB-LS and UNB-AS, *op. cit*.

16 See the course *history of contemporary Brazil*, UNESP-LS, *op. cit*., course 139203 (social and political history of Brazil), UNB-LS, *op. cit.*, and FCH 187 (history of Brazilian civilization), UFBA-MS, op. cit.

17 See courses SE035 (economics), UFPR-IM, *op. cit*., and ECO02206 (economic theory), UFGRS-LS, *op. cit.*

18 See courses 191019 (education), 191108 (philosophy of education), UNB-LS, *op. cit.*, four courses on education psychology (EDU01011, EDU01012, EDU01014 and EDU01022) offered at UFGRS-LS, *op. cit.*, and 301973 (education, indigenous science and technologies), UFSCAR-LS, *op. cit*.

19 See course 6HIS009 (history), UEL-AS, *op. cit*.

20 See course 184039 (law), UNB-LS, *op. cit*.

21 See courses 185035 (political Science), UNB-AS, *op. cit*., and UNB-LS, *op. cit*.

22 See courses PSI02206 (social psychology), UFGRS-LS, *op. cit*. and PSI02204 (psychology of communication), UFGRS-MS, *op. cit*. The two courses are general. Courses on social psychology that focus on information users are placed in cat. 34.

23 See courses BIO11417 (ecology), UFRGS-LS, *op. cit*. and SCN0081 (ecology), UNIRIO-MS, *op. cit*. that deal with geographical, biological and ecological issues

24 Most of the programs offer courses in computer science, for example, see the course *computer sciences,* UNESP-LS, *op. cit*.

13, 16, 19, 22, 25, 28, 31, 34) include core contents common to all undergraduate programs. The SP categories (cat. 8, 11, 14, 17, 20, 23, 26, 29, 32, 35) include contents designed for specific areas of expertise (e.g., librarianship (LS), archival studies (AS), museology (MS), and information management (i.e., managing knowledge in organizations) (IM). The PR categories (cat. 9, 12, 15, 18, 21, 24, 27, 30, 33, 36) include contents designed for developing skills and professional proficiency, and providing work experience. Note that theoretical knowledge and practical knowledge are often intermingled and covered in the same courses.

Information science is related to other fields that are necessary for understanding the diversified aspects of the information multifaceted phenomena. A few of them are essential for understanding the theoretical foundations of information science and they are part of the *foundation* section, while most of them are only relevant for understanding specific aspects of the field and they are part of the relevant sections according to their thematic contexts.

The *foundation* section (cat. 7-9) focuses on the philosophical, historical and methodological basis of information science. Category 7[25] encompasses philosophy of information science (11), history of information science (7), and research methodology[26] (14). The category also represents core related disciplines that are essential for establishing the foundations of information science; among them epistemology[27] (6), ethics[28] (2), mathematics[29], statistics[30] (7), and computer science[31]. Category 8[32] encompasses the theory and history of the specializations, for example, LS theory (3), AS theory (2) and MS theory (2). Category 9 encompasses practical knowledge related to the foundations of information science; especially mastery of research practices (8). All the reviewed programs include mandatory scientific research projects.

The *resources* section (cat. 10-12) focuses on issues related to knowledge resources. Resource-related issues are mainly centered on quality issues, relevancy issues, as well as theoretical and practical knowledge related to developing, maintaining, and managing information resources. Category 10[33] encompasses information quality (3) and information services (10) and resources in general. Category 11[34] encompasses specific issues related to types of archival resources (governmental, public and private) (4), library resources (5), and museum resources (5), record management (2), and standards (1). Category 12[35] encompasses workshops on international standards (modules for each standard, e.g. Dublin Core) (5), and familiarity with information resources and services (4).

The *knowledge worker* section (cat. 13-15) focuses on information science education. These issues are highly relevant for shaping the nature of the information professions, but we have not found any reflective courses that focus on information science education per se. However, we did find courses that are aimed at developing personality traits and fostering professional and ethical conduct[36]. These professional development and ethical education courses are represented in category 15.

The *contents* section (cat. 16-18) addresses content based issues. Content based issues are interrelated to resource based issues (cat. 10-12) and they often intermingle. Still, they differ and should be regarded as complementary, two sides of the same coin. Resources are the vessels and contents are what in them. Content issues related to metadata, including various types of structures (e.g., knowledge maps, subject classification schemes, taxonomies, ontologies,

25 See the course BIB03085 (information science), UFRGS-LS, *op. cit*.

26 See courses BIB03060 (research methodology applied to information science), UFRGS-LS, *op. cit*., and ICIA16 (methodology of scientific research), UFBA-AS, *op. cit*., and the course *scientific methodology*, UNESP-LS, *op. cit*.

27 See the course HFC0076 (epistemology), UNIRIO-M, *op. cit*.

28 See the course BIB03343 (ethics in information), which presents the theoretical and practical aspects of ethics applied to archival, library and museum Studies, UFRGS-LS, *op. cit*.

29 See e.g., SIN165 (mathematics), UFPR-IM, *op. cit*. and 301566 (mathematics in information theory), UFSCAR-LS, *op. cit*.

30 See, for example, the course MAT021 (statistics), UFBA-AS, *op. cit*. and STC1001 (statistics for Archival Studies), UFSM-AS, *op. cit*.

31 See e.g., DCG1005 (computer science), UFSM-AS, *op. cit*., and 113913 (computer sciences), UNB-LS, *op. cit*.

32 See e.g., ICIA06 (history of archives and documents), UFBA-AS, *op. cit*.

33 See courses BIB0342 (resources and information services), UFRGS-LS, *op. cit*., and UFRGS-MS, *op. cit*., ICI019 (quality in information services), UFBA-AS, *op. cit*., and the courses *sources of information* and *automated cataloging*, UNESP-LS, *op. cit*.

34 See courses ICIA31 (engineering archives) and ICIA26 (business archives), UFBA-AS, *op. cit*.

35 See, e.g., the course BIB03084 (document standardization), UFRGS-LS, *op.cit.*, the courses *document standardization*, *metadata for digital objects*, UNESP-LS, *op. cit*., the course *technical standards for information and documentation*, UFSCAR-LS, op. cit., and DCT1030 (archival standardization), UFSM-AS, *op. cit*.

36 See courses ICIA07 (ethical training of archivists), UFBA-AS, *op. cit*., DCT1033 (Professional Perspectives of the Archivist), UFSM-AS, *op. cit*., the course *professional practices in library sciences*, UNESP-LS, *op. cit*., and BIB03203 (professional ethics) and ADM01013 (entrepreneurship and innovation), which is aimed at developing attitudes and entrepreneurial skills, at UFRGS-MS, *op. cit*.

and thesauri), library classification systems (e.g., LCC, DDC, UDC, CC, and BC), types of contents (e.g., academic and scientific (4), business (3), educational (2), legal (9), medical (9), and social (4) information), and subjects (i.e., archeology, biology, computer science). Category 16 encompasses core fields that are centered in contents. Two of the main fields are knowledge organization (9)[37] and knowledge representation (5)[38]. Category 17[39] covers specialized based fields that are centered in specific contents and subjects, such as educational informatics, business informatics, legal informatics, medical informatics, and social information. Category 18[40] encompasses practical knowledge related to collection development (17) and quality evaluation.

The *applications* section (cat. 19-21) addresses issues related to the functions and purpose that information resources are designed to meet. It encompasses information searching (or retrieval), shopping, social networking, and promoting human well-being, education, health, and security. The term "application" refers to the functions and purposes of using information resources and acquiring knowledge; not to be confused with the common use of "application," which refers to software designed to perform specific tasks. Category 19 encompasses core fields such as information searching (5) and social networking (7). Category 20 includes applications like publishing[41] (9). Category 21 covers practical knowledge related to these fields.

The *operations and processes* section (cat. 22-24) encompasses issues related to the various activities involved in mediating human knowledge; among them documentation, representation (9), visualization[42] (1), organization, processing, storage, digitization, preservation, conservation, dissemination, publication, searching, manipulation, evaluation, and measurement (4). Information measurement underlies informetrics (4), bibliometrics, webometrics and cybermetrics, as well as scientometrics that are offered by a few programs[43]. Since human activities may relate to several intermingled aspects of the information phenomena some of these processes may be represented by other sections of the model$_{2.2}$ as well. Category 22[44] encompasses core operations and processes that are common to all programs, among them information searching, knowledge representation and knowledge organization. Category 23 represents specialized based activities such as digitization (1), digital and physical preservation, and archival appraisal (3). Digital preservation[45] (7), for example, is included in LS, AS, and MS programs that teach the preservation of documents, books, artifacts, and digital materials in the specialized contexts. Category 24 encompasses mastery of practices in information based activities, among them descriptive treatment (7). All the programs offer courses on descriptive treatment in different contexts (e.g., abstracting, cataloging, archiving)[46].

The *technology* section (cat.25-27) focuses on information technology. Information technology is the backbone of LIS education in Brazil and common to all the programs. "Information technology" is an umbrella term that embodies all the processes and products involved in the mediation of knowledge. Information technology is a fundamental building block of LIS education and included in all the programs. Category 25[47] includes the field of information technology (8). The reviewed programs offer a wide selection of technology-based courses on information systems (6), digital libraries, network technologies (1), information architecture, information security, and more. Category 26[48] covers technology-based subjects relevant for specialized programs. There is no information technology specialization in the BA level in Brazil. Still, the panel listed

37 See the courses *elements of knowledge organization* and *bibliographic classification systems*, UNESP-LS, *op. cit.*, courses 182052 (cataloging) and 182079 (classification), UNB-LS, *op. cit*.

38 See the course *logical and linguistic elements in organization and representation of knowledge*, UNESP-LS, *op. cit.*

39 See the course BIB03079 (specialized information), UFGRS-LS, *op. cit*. The course covers subject-based knowledge in social sciences, humanities, science and technology.

40 See e.g., SIN200 (laboratory for knowledge organizations), UFPR-IM, *op. cit.*, and 182591 (training in collections), UNB-LS, *op. cit*.

41 See the course *electronic publishing*, UNESP-LS, *op. cit.*, BIB03064 (production of electronic documents), UFRGS-MS, *op. cit.*, and 145084 (publishing), UNB-LS, *op. cit*.

42 See the course SIN144 (information visualization), UFPR-IM, *op. cit.*

43 6 Brazilians programs (PUCCAMP-LS, UFF-LS, UFRGS-LS, UFSCAR-LS, UNESP-LS, UNIRIO-LS) offer courses that address information measurement; 3 of them are analyzed in this study: UFRGS-LS (BIB03351 bibliometrics), *op. cit*., UFSCAR-LS (300438 bibliometrics), *op. cit.*, and UNESP-LS (quantitative methods: bibliometrics), *op. cit*.

44 See, for example, ICIA28 (representation and retrieval), UFBA-AS, *op. cit.*, and 182079 (rating), UNB-LS, *op. cit*.

45 See the course *digital preservation*, UNESP-LS, *op. cit*., ICIA40 (digital preservation), UFBA-AS, *op. cit.*, and 6CIN024 (preservation of digital documents), UEL-AS, *op. cit*.

46 See e.g., ICIA11 (archival description), UFBA-AS, *op. cit*.

47 See, for example, BIB03334 (digital documents) and BIB03233 (digital libraries), UFRGS-LS, *op. cit.*, 116378 (databases), UNB-LS, *op. cit*., 2CIN050 (digital repositories) and 2CIN052 (information architecture), UEL-LS, *op. cit*., SIN174 (modeling systems) and SIN188 (data security), UFPR-IM, *op. cit*.

48 See e.g., BIB03210 (museum information systems), UFRGS-M, *op. cit*.

a wide range of technology-based fields, among them digital curation (3), information architecture (15), digital libraries (13), digital repositories (5), information system (3), and Web services (3). This could indicate a need to anchor the technology in the specialized areas (LS, AS, IM, and MS) as well as the need for specialized programs in information technology (IT). Category 27[49] encompasses technology based practical knowledge that enables the student to function as information professionals while utilizing state of the art information and communication technologies. Internet literacy is a prerequisite in all programs. Programming courses are optional and they differ by the level of expertise and professionalism.

The *environment* section (cat. 28-30) encompasses studies of social, economic, ethnic and cultural, legal, ethical, and professional aspects of the information environment. Category 28[50] covers environment based core fields that implement the diversified perspectives of the information society, among them information culture, information policy (9) information ethics (10), information economics, information security, and the like. Category 29 covers subfields relevant to specialization areas, for example, community history (AS and LS)[51], business management, and marketing (IM)[52]. These specialized contents are often offered by LS, AS, and MS programs[53]. Category 30 covers social competencies and skills that are needed for functioning in diversified information environments and cultural milieus.

The *organization* section (cat. 31-33) focusses on the organizational aspect of the information work. It encompasses studies of organizational settings, information organizations (e.g., libraries, archives, museums, information services, and information centers), and management of organizational knowledge in the government, the public, and the private sectors. These three areas highlight three interrelated basics of the organizational building block: people, social entities, and knowledge. Studies of organizational settings and information organizations are usually part of LIS core education while knowledge management (i.e., management of organizational knowledge) studies (KM) are usually part of management studies (IM). Category 31 includes fields that are relevant for the study of organizational settings[54] and information organizations[55]. Note that studies of information management (5), information policy, information ethics, and information economics (1) are relevant here if they refer to the organizational perspective along with the environmental broader perspective (e.g., studies of archival information policies).

Category 32 encompasses KM studies that are the backbone of IM specialization[56]. These include management studies[57] (10), business management[58], and sociology of organizations[59]. The panel suggested contents indicate that organizational contents and management-based contents are relevant for all the programs: knowledge management (10), private (business) organizations (2), public (NGO) organizations (14), organizational aspect for AS (2), LS (4), and MS (3). In fact, LS, AS, and MS programs too offer IM based contents[60]. Category 33[61] encompasses competencies and skill related to organizational conditions and knowledge management (12).

The *user* section (cat. 34-36) focuses on the end users and their information needs and interests. Category 34 includes the fields of user studies (5)[62] and social psychology (1). Category 35[63] focuses on users of libraries, archives, and museums. Category 36 encompasses practical knowledge related to users (2) and user education[64].

49 See courses DCT1035 (programming for the internet), UFSM-AS, *op. cit*., SIN176 (programming), UFPR-IM, *op. cit*., INF01040 (programming), UFRGS-LS, *op. cit.,* and BIB03236 (programming for the web: archives, libraries and museums), UFRGS-MS, *op. cit*.,

50 See courses BIB03082 **(**information and citizenship) and BIB03095 (information and social memory), UFGRS-MS, *op. cit*., 2CIN054 (information policy), UEL-LS, *op. cit.,* and SIN188 (information security), UFPR-IM, *op. cit*.

51 See e.g., ICI218 (archives and Brazilian culture), UFBA-AS, *op. cit*., HEM (museums, culture and society), UNIRIO-MS, *op. cit*., and 182494 (library and Brazilian society), UNB-LS, *op. cit*.

52 See courses SIN181 (business management), SIN175 (marketing), UFPR-IM, *op. cit*., and 300136 (products marketing and information services), UFSCAR-LS, op. cit.

53 See courses ICIA21 (marketing of information services), UFBA-AS, *op. cit*., and 170054 (business activity), UNB-LS, *op. cit*.

54 See the course *organizational dynamics*, UNESP, op. cit.

55 See courses *strategic tools for managing libraries*, UNESP-LS, *op. cit*., 182826 (management of archives), UNB-AS, *op. cit*., BIB 03209 (management of museums), UFRGS-MS, *op. cit*., and HEM (management of museums and collections), UNIRIO-MS, *op. cit*.

56 See e.g., SIN193 (knowledge management), UFPR-IM, *op. cit*.

57 See e.g., SA104 (organizational management), UFPR-IM, *op. cit*.

58 See e.g., SIN181 (business management), UFPR-IM, *op. cit*.

59 See e.g., SIN194 (information and organizational culture), UFPR-IM, *op. cit*.

60 See e.g., 181013 (management), UNB-LS, *op. cit*.

61 See e.g., SIN196 (supervised internship), UFPR-IM, *op. cit*., and *curricular internship*, UNESP-LS, *op. cit*.

62 See e.g., 182 532 (survey of users), UNB-AS, *op. cit*., BIB03021 (study of communities and users), UFRGS-MS, op. cit., SIN177 (needs and uses of information), UFPR-IM, *op. cit*., and BIB03021 (study of communities and users), UFRGS-MS, *op. cit.*

63 See e.g., 6CIN028E (archives' user studies), UEL-AS, *op. cit*.

64 See e.g., BIB03092 (user education), UFRGS-MS, *op. cit*., and *user education*, UNESP-LS, *op. cit*.

Table 3: Contents suggested by the panel members

Content	General education (GE)	Literacy studies		1	B	communication skills (4); languages: Portuguese (2), Spanish (2), English (4); information literacy (3)
					A	communication skills (2); languages: Portuguese (3), English (3); information literacy (2)
		Humanities		2	B	literature (2), philosophy (1), logic (1), linguistics (5), semiotics (2)
					A	art (1), literature (1), philosophy (2), logic (2), linguistic (5), semiotics (2)
		Social sciences		3	B	Brazilian studies (2), economics (1), education (1), history (3), law (1), political science (1), sociology (3)
					A	Brazilian studies (2), history (1), political science (1), sociology (2)
		Natural sciences		4	B	
					A	
		Life sciences		5	B	psychology (2)
					A	psychology (1)
		Technology studies		6	B	computer science (4)
					A	computer science (5)
	Information science (IS)	Foundations	GIS	7	B	philosophy of information science (2), history of information science (5), research methodology (6), epistemology (3), ethics (1), statistics (3).
					A	philosophy of information science (9), history of information science (2), research methodology (8), epistemology (3), ethics (1), statistics (4).
			SP	8	B	archival studies theory (1), library theory (1), museum theory (1)
					A	archival studies theory (1), library theory (2), museum theory (1)
			PR	9	B	research methodology (2)
					A	research methodology (6)
		Resources	GIS	10	B	information quality (2), information services (4)
					A	information quality (1), information services (6)
			SP	11	B	archival resources (4), library resources (5), museum resources (2),
					A	record management (2), standards (1)
			PR	12	B	information services (2), international standards (resources) (3)
					A	information services (2), international standards (resources) (2)
		Knowledge workers	GIS	13	B	
					A	
			SP	14		
			PR	15	B	
					A	
		Contents	GIS	16	B	knowledge organization (2), knowledge representation (1),
					A	knowledge organization (7), knowledge representation (4), metadata (3), ontologies (4), taxonomies (2),
			SP	17	B	business information (2), educational information (1), legal information (4), medical information (5), social information (2)
					A	business information (1), educational information (1), legal information (5), medical information (4), scientific information (4), social information (2)
			PR	18	B	collection development (6)
					A	collection development (11)
		Applications	GIS	19	B	information searching (1), social networking (3)
					A	information searching (4), social networking (4)
			SP	20	B	electronic publishing (3),
					A	electronic publishing (6)
			PR	21	B	
					A	
		Operations & Processes	GIS	22	B	information searching (1), knowledge representation (4)
					A	information searching (4), knowledge representation (5), information visualization (1), informetrics (4)
			SP	23	B	digital preservation (4), information access (1),
					A	digitalization (1), digital preservation (3), archival appraisal (3)
			PR	24	B	information searching (2), descriptive treatment (6),
					A	information searching (2) descriptive treatment (1), classification (3)
		Technologies	GIS	25	B	information technologies (5), information systems (3), network technologies (1)
					A	information technologies (3), information systems (3)
			SP	26	B	digital curation (3), information architecture (7), digital libraries (9), digital repositories (3), information system (1), web services (3)
					A	information architecture (8), digital libraries (4), digital repositories (2), information systems (2)
			PR	27	B	internet (6)
					A	internet (5), programming (1)
		Environments	GIS	28	B	information ethics (5), information policy (5)
					A	information ethics (5), information policy (4)
			SP	29	B	information economics (6)
					A	information economics (2), information policy (2)
			PR	30	B	information ethics (1)
					A	information ethics (1)
		Organizations	GIS	31	B	knowledge management (2), information economy (1)
					A	knowledge management (3)
			SP	32	B	knowledge management (4), private (business) organizations (1), public (NGO or GO) organizations (8), organizational aspect (AS) (1), (LS) (2), (MS) (1)
					A	knowledge management (6), private (business) organizations (1), public (NGO or GO) organizations (6), organizational aspect (AS) (1), (LS) (2), (MS) (2)
			PR	33	B	
					A	knowledge management (12)
		Users	GIS	34	B	users studies (1), social psychology (1)
					A	users studies (4)
			SP	35	B	users studies (1)
					A	users studies (4)
			PR	36	B	
					A	user studies (2)

* The numbers in brackets shows the number of panel members who suggested the listed contents.

Own: Source

Structure

The legal framework of the undergraduate studies was set by the board of higher education at the ministry of education in 2007[65]. BA programs have 2,400 – 2880 academic hours (80-96 courses) in 3 or 4 years. Practically, all the BA programs in Brazil have more than 2500 hours in 4 years. For example, the LS program at UNESP has 2670 hours in 4 years, the AS program at UNESP has 2880 hours in 4 years, and the MS program at UNIRIO has 2940 hours in 4 years.

The combination of general contents and specialized contents that span over 3 to 4 years creates 9 optional formats of LIS programs (see table 4).

Table 4: 9 formats of LIS programs

Format / Year >>>	**1st year**	**2nd year**	**3rd year**	**4th year**
Format 1	General studies			
1* Format 2	General studies	Specialization		
8* Format 3	General studies		Specialization	
2* Format 4	General studies			Specialization
Format 5	Specialization			
Format 6	General studies			
Format 7	General studies		Specialization	
Format 8	General studies	Specialization		
Format 9	Specialization			

* Number of panel members

Own: Source

The *General studies* module encompasses GE, GIS, and PR contents aimed for all the students and common to all undergraduate programs. The *Specialization* module encompasses SP and PR contents respectively aimed for student who participate in the LS, AS, MS, and IM specialized programs.

The third format is the most popular among the panel members who stated their positions on the preferred structure of LIS programs. Eight scholars suggested to dedicate the first 2 years to general studies and to focus in the last 2 years in the specialization-based studies.

3.4 The model$_{2.2}$

The integration of the content categories and the structure of the program forms a structured model$_{2.2}$ for selecting the planned contents. It comprises 36 pairs of core categories and respectively spans over three to four years: a total of 288 content categories (36 X 2 X 4) (see table 5). The planned contents are not part of the model$_{2.2}$. They are represented in the model$_{2.2}$ by placing them in the relevant categories. The model$_{2.2}$ is valid as long as any relevant content can be placed in at least one of the 288 content categories.

65 See resolution no. 2, June 18, 2007 (CNE / CES No. 8/2007), the Ministry of Education (http://portal.mec.gov.br/cne/arquivos/pdf/2007/rces002_07.pdf, accessed on October 16, 2014)

Table 5: Model$_{2.2}$

Year: >>>						1st year	2nd year	3rd year	4th year
Contents	General education (ED)	Literacy studies		1	B			*communication (30h)*	
					A	*Portuguese (60h)*			
		Humanities		2	B				
					A	*history of culture*	*history of Brazil*		
		Social sciences		3	B				
					A				
		Natural sciences		4	B				
					A				
		Life sciences		5	B				
					A				
		Technology studies		6	B	*computer sciences*			
					A				
	Information science	Foundations	GIS	7	B				
					A	*scientific methodology*			
			SP	8	B	*theoretical foundations*			
					A				
			PR	9	B		*research methodology*		
					A				*capstone project*
		Resources	GIS	10	B				
					A	*sources of information*			
			SP	11	B				
					A				
			PR	12	B	*metadata*			
					A	*standardization*			
		Knowledge workers	GIS	13	B				*professional practices*
					A				
			SP	14	B				
					A				
			PR	15	B				
					A				
		Contents	GIS	16	B	*Cataloging*			
					A	*knowledge organization*	*classification systems*		
			SP	17	B				
					A				
			PR	18	B				
					A			*Collection development*	
		Applications	GIS	19	B				*electronic publishing*
					A				
			SP	20	B				
					A				
			PR	21	B				
					A				
		Operations & Processes	GIS	22	B				
					A		*quantitative methods*		
			SP	23	B			*digital preservation*	
					A				
			PR	24	B	*Cataloging; metadata*			
					A				
		Technologies	GIS	25	B				*digital libraries*
					A		*information architecture*		
			SP	26	B				
					A				
			PR	27	B		*database modeling*		
					A				
		Environments	GIS	28	B				
					A				
			SP	29	B		*marketing in info. units*		*knowledge management*
					A				
			PR	30	B				
					A				
		Organizations	GIS	31	B			*organizational dynamics*	*library management*
					A				
			SP	32	B				
					A		*managing info. units*		
			PR	33	B				
					A				*supervised internship*
		Users	GIS	34	B				
					A		*user studies*		
			SP	35	B				
					A				
			PR	36	B			*user education*	
					A				

* Exemplary contents from the UNESP-LS program.

Own: Source

4 DISCUSSION AND CONCLUSION

As noted above, this article is the second article of a group of two articles that resulted from a study conducted in Brazil in 2011– 2014. The first article presents a universal $model_1$ that sets the guiding principles for developing bachelor's degree programs in library and information science applicable worldwide (ZINS; SANTOS, in press). This article presents a local $model_2$. It demonstrates how the curricular reasoning is implemented in the Brazilian milieu. Therefore, the conclusions stated in the first article are applicable, mutatis mutandis, in this article too. We assume that the readers read both articles. Nevertheless, for the readers who are interested only in the Brazilian milieu and skip the first article we summarize here the main conclusions.

The Brazilian $model_2$ too – as the universal $model_1$ – is composed of two complementary models. The first $model_{2.1}$ is the four step developing process. The second $model_{2.2}$ is the structured plan of 288 content categories. The two complementary models are combined into an integrated $model_2$ by using the structured plan while selecting and ordering the contents. The models lay the foundations of systematic curricular reasoning involved in the four step development process and in the content selection process. Again it is important to emphasize that both models need ad-hoc adjustments. They should be critically reviewed and implemented in the real world by the faculty members of each institution.

The structured 288 category plan of contents ($model_{2.2}$) makes it possible to present the complicated thematic relations among the various contents (fields and courses) by differentiating among the categories and the contents. The contents are not part of the $model_{2.2}$ but are represented in the various categories.

The $model_{2.2}$ is a powerful tool for developing and evaluating LIS academic programs and courses. Developing and evaluating may be viewed as two complementary activities. Still, they are based on different thinking. Developing is based on synthetic thinking while evaluating is based on analytic thinking. Programs and courses are products of synthesis of contents. They are composed of series of interrelated contents. While using the $model_{2.2}$ for developing a course the developer assembles the relevant contents from various categories, but while using the $model_{2.2}$ for evaluating a course the evaluator separates the contents and places them in the relevant categories. Many information science subfields and courses encompass different perspectives and they can be represented in several categories

While reviewing the Brazilian programs we could not avoid the impression that LIS education in Brazil is still stuck in the traditional stage and fails to catch the current trends in LIS education. This impression is strengthened when compared with the contents of LIS programs in other countries, as they are listed in the first article. The impression is also echoed in the panel discussion:

> LIS education in Brazil has failed to address some of the new opportunities that are presented by the emergence of the digital information technologies. Much of what is taught today is applicable only in physical environments. Subjects like ontologies, information architecture, information representation on digital environments, and the like are often missing from the curricula. (DIAS 2012, personal communication, October 10)

> We have emphasized in our curricula many topics that do not distinguish our professionals from others, and the ideal core knowledge should include a lot of information technology expertise (e.g., web, programming, databases, interfaces) articulated with the main and traditional concepts of information retrieval, knowledge and information representation, knowledge management and the study of users and use of information. We have abandoned the ambition to work in the fringes of what is done today with information, and that deals more and more with information technology. (SOUZA, 2012, personal communication, August 26)

The need for revising the programs and adjusting them to new approaches and innovative information and communication technologies is evident. Many of the reviewed programs have eclectic nature and they do offer contents that specialized in information technology and information management, which

exceed beyond the traditional frameworks of library studies, archival studies, and museum studies. This indicates that LIS in Brazil is open to what happens in the global context despite its rigid organizational structure.

The need for changing the rigid organizational structure also emerges from the panel selection of the preferred structure of LIS programs. The selected format (format 3) is composed of two even parts of two years. Eight scholars suggested to dedicate the first two years to general studies and to focus in the last two years in the specialization-based studies. If the format will be generally applied in the Brazilian milieu this will change LIS education, which currently seems to be locked in rigid frames, and make it more flexible to adopt innovative approaches and updated fields of expertise.

The field of library and information science is constantly changing and so is library and information science education. The profound insight that comes out of the study is the invaluable impact of the curricular reasoning for improving LIS academic education in the global context and in the Brazilian local context as well.

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MODELO BRASILEIRO DE ESTUDOS EM BIBLIOTECONOMIA E CIÊNCIA DA INFORMAÇÃO EM NÍVEL DE GRADUAÇÃO

RESUMO *O artigo é resultante de um estudo que tem como objetivo melhorar a formação acadêmica em Biblioteconomia e na Ciência da Informação no Brasil pela estruturação do raciocínio curricular que molda o conteúdo de programas acadêmicos de graduação. Ele é a segunda comunicação de um grupo de dois trabalhos resultantes de um estudo realizado no Brasil, no período de 2011-2014. O primeiro trabalho apresenta um modelo universal (model1) para programas em Biblioteconomia e Ciência da Informação (ZINS; SANTOS, 2016, no prelo). Este artigo apresenta o modelo brasileiro (model2). Esta parte da pesquisa foi composta de duas fases metodológicas. A primeira fase foi um estudo sistemático com Delphi Crítico com a participação de 21 pesquisadores brasileiros da Ciência da Informação. A segunda fase foi uma avaliação assistemática para a formação das categorias de conteúdo. A avaliação foi baseada na Teoria Fundamentada para a análise de 13 programas acadêmicos no Brasil. O estudo resultou em um model2 que define os princípios orientadores para o desenvolvimento de cursos de graduação no Brasil. O modelo é composto de dois modelos complementares: um processo sistemático de desenvolvimento em quatro etapas (model2.1) e um plano estruturado de 288 categorias de conteúdo (model2.2). O estudo fornece um modelo estruturado para seleção de conteúdo, na proposta de melhorar o desenvolvimento e a avaliação de programas Biblioteconomia e Ciência da Informação no Brasil. O estudo destaca o papel essencial da fundamentação curricular para melhorar o ensino de Biblioteconomia e Ciência da Informação a partir de um raciocínio curricular que é fundamentado no contexto brasileiro.*

Palavras-Chave: *Ensino em Biblioteconomia e Ciência da Informação. Graduação em Biblioteconomia e Ciência da Informação. Desenvolvimento curricular. Seleção de conteúdos em Biblioteconomia e Ciência da Informação.*

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Appendix A. Part 1: 46 LIS Institutions in Brazil

Federal University of Alagoas [Univ Federal de Alagoas (UFAL)], Maceió, AL; **Federal University of Amazonas** [Univ Federal do Amazonas (UFAM)], Manaus, AM; **Federal University of Bahia** [Univ Federal da Bahia (UFBA)], Salvador, BA; **Federal University of Cariri** [Univ Federal do Cariri (UFCA)], Juazeiro do Norte, CE; **Federal University of Ceara** [Univ Federal do Ceará (UFC)], Fortaleza, CE; **Federal University of Espirito Santo** [Univ Federal do Espírito Santo (UFES)], Vitória, ES; **Federal University of Goias** [Univ Federal de Goiás (UFG)], Goiânia – GO; **Federal University of Maranhão** [Univ Federal do Maranhão (UFMA)], São Luiz, MA; **Federal University of Mato Grosso** [Univ Federal de Mato Grosso (UFMT)], Rondonópolis, MT; **Federal University of Minas Gerais** [Univ Federal de Minas Gerais (UFMG)], Belo Horizonte, MG; **Federal University of Ouro Preto** [Univ Federal de Ouro Preto (UFOP)], Ouro Preto, MG; **Federal University of Para** [Univ Federal do Pará (UFPA)], Belém, PA; **Federal University of Paraiba** [Univ Federal da Paraíba (UFPB)] João Pessoa, PB; **Federal University of Paraná** [Univ Federal do Paraná (UFPR)], Curitiba, PR; **Federal University of Pelotas** [Univ Federal de Pelotas (UFPEL)], Pelotas, RS; **Federal University of Pernambuco** [Univ Federal de Pernambuco (UFPE)], Recife, PE; **Federal University of Reconcavo of Bahia** [Univ Federal do Recôncavo da Bahia (UFRB)], Cachoeira, BA; **Federal University of Rio de Janeiro** [Univ Federal do Rio de Janeiro (UFRJ)], Rio de Janeiro, RJ; **Federal University of Rio Grande** [Univ Federal do Rio Grande (FURG)], Rio Grande, RS; **Federal University of Rio Grande do Norte** [Univ Federal do Rio Grande do Norte (UFRN)], Natal, RN; **Federal University of Rio Grande do Sul** [Univ Federal do Rio Grande do Sul (UFRGS)], Porto Alegre, RS; **Federal University of Rondônia** [Univ Federal de Rondônia (UNIR)], **Federal University of Santa Catarina** [Univ Federal de Santa Catarina (UFSC)], Florianópolis, SC, Brazil; **Federal University of Santa Maria** [Univ Federal de Santa Maria (UFSM)], Santa Maria, RS; **Federal University of São Carlos** [Univ Federal de São Carlos (UFSCAR)], São Carlos, SP; **Federal University of Sergipe** [Univ Federal de Sergipe (UFS)], Aracajú, SE; **Federal University of the State of Rio de Janeiro** [Univ Federal do Estado do Rio de Janeiro (UNIRIO)], Rio de Janeiro, RJ; **Federal University of Uberlandia** [Univ Federal de Uberlândia (UFU)], Uberlândia, MG; **Fluminense Federal University** [Univ Federal Fluminense (UFF)], Niterói, RJ; **Institute of Funlec** [Instituto Superior da Funlec (IESF)], Campo Grande, MG; **Integrated Schools Coração de Jesus** [Faculdades Integradas Coração de Jesus (FAINC)], Santo André, SP; **Integrated Schools Teresa D`Avila** [Faculdades Integradas Teresa D'Ávila (FATEA)], Lorena, SP; **Londrina State University** [Univ Estadual de Londrina (UEL)], Londrina, PR; **Paraiba State University** [Univ Estadual da Paraíba – (UEPB)], João Pessoa, PB; **Piaui State University** [Univ Estadual do Piauí (UESPI)], Teresina, PI; **Pontifical Catholic University of Campinas** [Pontifícia Univ Católica de Campinas (PUCCAMP)], Campinas, SP; **Santa Catarina State University** [Univ do Estado de Santa Catarina (UDESC)], Florianópolis, SC; **Santa Ursula University** [Univ Santa Úrsula (USU)], Rio de Janeiro, RJ; **São Paulo State University** [Univ Estadual Paulista (UNESP)], Marília, SP; **School of Sociology and Politics of Sao Paulo** [Fundação Escola de Sociologia e Política de São Paulo (FESP)], São Paulo, SP; **University Center Assunção** [Centro Universitário Assunção (UNIFAI)], São Paulo, SP; **University Center Barriga Verde** [Centro Universitário Barriga Verde (UNIBAVE)], Orleans, SC; São Paulo, SP; **University Center of Formiga** [Centro Universitário de Formiga (UNIFOR)], Formiga, MG; **University of Brasilia** [Univ de Brasília (UNB)], Brasília, DF; **University of Caxias do Sul** [Univ de Caxias do Sul (UCS)], Caxias do Sul, RS, **University of São Paulo** [Univ de São Paulo (USP)], São Paulo, SP.

Appendix A. Part 2: Academic degrees programs in LIS 46 Institutions in Brazil

Institution	Locations	Degree															
		BA				PM				MSc				PhD			
			IS				IS				IS				IS		
		LS	AS	MS	IM	LS	AS	MS	IM	LS	AS	MS	IM	LS	AS	MS	IM
UFAM	**N** / Manaus, AM	X	X														
UFPA	**N** / Belém, PA	X	X	X													
UNIR	**N** / Porto Velho, RO	X															
UEPB	**NE /** João Pessoa, PB		X														
UESPI	**NE /** Teresina, PI	X															
UFAL	**NE** / Maceió, AL	X															
UFBA	**NE** / Salvador, BA	X	X	X								X				X	
UFC	**NE** / Fortaleza, CE	X															
UFCA	**NE /** J. do Norte, CE	X															
UFMA	**NE /** São Luiz, MA	X															
UFPB	**NE /** João Pessoa, PB	X	X									X				X	
UFPE	**NE /** Recife, PE	X		X	X							X				X	
UFRB	**NE /** Cachoeira, BA			X													
UFRN	**NE** / Natal, RN	X															
UFS	**NE /** Aracajú, SE	X		X													
IESF	**CW** / C. Grande, MS	X															
UFG	**CW** / Goiânia, GO	X		X	X												
UFMT	**C W** / Rondonópolis,MT	X															
UNB	**CW** / Brasília, DF	X	X	X								X				X	
FAINC	**SE** / Santo André, SP	X															
FATEA	**SE** / Lorena, SP	X															
FESP	**SE** / São Paulo, SP	X															
PUCCAMP	**SE** / Campinas, SP	X															
UFF	**SE** / Niterói, RJ	X	X									X				X	
UFOP	**SE** / Ouro Preto, MG			X													
UFSCAR	**SE** / São Carlos, SP	X										X				X	
UNESP	**SE** / Marília, SP	X	X									X				X	
UNIFAI	**SE** / São Paulo, SP	X															
UNIFOR	**SE** / Formiga, MG	X															
UNIRIO	**SE** / Rio de Janeiro, RJ	X	X	X		X	X					X[1]				X[1]	
USP/ECA	**SE** / São Paulo, SP	X										X				X	
USP/FFCL	**SE** /Ribeirão Preto, SP	X															
USP/MAE/ MAC/MP/MZ	**SE** / São Paulo, SP											X[2]					
UFES	**SE** / Vitória, ES	X	X														
UFMG	**SE**/ B. Horizonte, MG	X	X	X								X				X	
UFRJ	**SE**/ Rio de Janeiro, RJ	X										X				X	
UFU	**SE** / Uberlândia, MG				X												
USU	**SE**/ Rio de Janeiro, RJ	X															
FURG	**S** / Rio Grande, RS	X	X														
UCS	**S** / Caxias do Sul, RS	X[3]															
UDESC	**S** / Florianópolis, SC	X							X								
UEL	**S** / Londrina, PR	X	X									X				X	
UFPEL	**S** / Pelotas, RS			X													
UFPR	**S** / Curtiba, PR				X								X[4]				
UFRGS	**S** / Porto Alegre, RS	X	X	X													
UFSC	**S** / Florianópolis, SC	X	X	X								X				X	
UFSM	**S** / Santa Maria, RS		X														
UNIBAVE	**S** / Orleans, SC			X													
Total : 46		39	16	14	4				3			15				14	

1. UNIRIO offers MSc and PhD in museology; not in information Science. 2. USP/MAE/MAC/MP/MZ offers MSc in museology; not in information science. 3. Distance Learning. 3. UFPR offers MSc in information management; not in information science.

Appendix B: The Panel

Dr. André Porto Ancona Lopez, University of Brasília [Univ de Brasília (UNB)], Brasília - DF, Brazil; **Dr. Beatriz Valadares Cendón**, Federal University of Minas Gerais [Univ Federal de Minas Gerais (UFMG)], Belo Horizonte – MG, Brazil; **Dr. Carlos Henrique Marcondes de Almeida**, Fluminense Federal University [Univ Federal Fluminense (UFF)], Niterói – RJ, Brazil; **Dr. Ely Francina Tannuri de Oliveira**, São Paulo State University [Univ Estadual Paulista (UNESP)], Marília – SP, Brazil; **Dr. Guilherme Ataíde Dias**, Federal University of Paraíba [Univ Federal da Paraíba (UFPB)], João Pessoa – PB, Brazil; **Dr. Icléa Thiesen**, Federal University of Rio de Janeiro State [Univ Federal do Estado do Rio de Janeiro (UNIRIO)], Rio de Janeiro – RJ, Brazil; **Dr. Isa Maria Freire**, Federal University of Paraíba [Univ Federal da Paraíba (UFPB)], João Pessoa – PB, Brazil; **Dr. Leilah Santiago Bufrem**, Federal University of Paraná [Univ Federal do Paraná (UFPR)], Curitiba - PR, Brazil; **Dr. Lena Vânia Ribeiro Pinheiro**, Brazilian Institute of Information in Science and Technology [Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT)], Rio de Janeiro - RJ, Brazil; **Dr. Luis Fernando Sayão**, Federal University of Rio de Janeiro State [Univ Federal do Estado do Rio de Janeiro (UNIRIO)], Rio de Janeiro – RJ, Brazil *and the National Committee of Nuclear Energy [Comissão Nacional de Energia Nuclear (CNEN)]*; **Dr. Mariângela Spotti Lopes Fujita**, São Paulo State University [Univ Estadual Paulista (UNESP)], Marília – SP, Brazil; **Dr. Marlene Oliveira**, Federal University of Minas Gerais [Univ Federal de Minas Gerais (UFMG)], Belo Horizonte - MG, Brazil; **Dr. Marta Lígia Pomim Valentim**, São Paulo State University [Univ Estadual Paulista (UNESP)], Marília – SP, Brazil; **Dr. Mauricio Barcellos Almeida**, Federal University of Minas Gerais [Univ Federal de Minas Gerais (UFMG)], Belo Horizonte – MG, Brazil; **Dr. Nanci Elizabeth Oddone**, Federal University of Bahia [Univ Federal da Bahia (UFBA)], Salvador - BA (round 1) and the Federal University of Rio de Janeiro State [Univ Federal do Estado do Rio de Janeiro (UNIRIO)], Rio de Janeiro – RJ, Brazil (rounds 2 & 3); **Dr. Patrícia Zeni Marchiori**, Federal University of Paraná [Univ Federal do Paraná (UFPR)], Curitiba - PR, Brazil; **Dr. Renato Rocha Souza**, Applied Mathematics School of Getulio Vargas Foundation [Escola de Matemática Aplicada da Fundação Getulio Vargas (EMAp/FGV)], Rio de Janeiro - RJ and the Federal University of Minas Gerais [Univ Federal de Minas Gerais (UFMG)], Belo Horizonte – MG, Brazil; **Dr. Rosali Fernandez de Souza**, Brazilian Institute of Information in Science and Technology [Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT)] Rio de Janeiro - RJ, Brazil; **Dr. Silvana Aparecida Borsetti Gregorio Vidotti**, São Paulo State University [Univ Estadual Paulista (UNESP)], Marilia - SP, Brazil; **Dr. Silvana Drumond Monteiro**, Londrina State University [Univ Estadual de Londrina (UEL)], Londrina – PR, Brazil; **Dr. Sueli Angélica do Amaral**, University of Brasília [Univ de Brasília (UNB)], Brasília – DF, Brazil.

Appendix C: Excerpts from the three questionnaires on the universal model

Information Science Education in Brazil
First Round

1. Conception of information science

Information Science is the study of the mediating aspects of human knowledge as they are implemented in the social domain. In other words information science focuses on connecting resources and users. It deals with technological as well as social and cultural perspectives. This conception is the mainstream in Brazil.

(The panel was asked to comment)

2. Vision of information science program

Question 2
What is your vision of the ideal BA information science academic program in Brazil?

3. Vision of the ideal graduate

Question 3
What is your vision of the ideal graduate?
What do you expect him/her to know (theoretical and practical knowledge)?

Information Science Education in Brazil
Second Round

1. Rationale

Question 1.1
Is library studies part of information science?

Question 1.2
Is archival studies part of information science?

Question 1.3
Is museum studies part of information science?

Information Science Education in Brazil
Third Round

(In the third round the panel was asked (1) to comment on the model and the academic goals for LIS programs in Brazil; (2) to specify in details the contents for the general education, the general LIS education, the specialized LIS education, and the practical knowledge education; (3) to comment on the structure and length of LIS BA studies. Finally, the panel members were asked to critically reevaluate their responses, and, if necessary, revise them.)