

The presence of logic in the domain of knowledge organization: interdisciplinary aspects of college curricula

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Abstract

A reflection about the curricular presence of logic in the domain of knowledge organization (KO), particularly in the field of Information Science (IS). It tries to identify, in the programs of 42 IS schools in Brazil, the curricular space destined to this subject, to make evident the relations between this discipline and the practices and competencies expected in the profile of information professionals in this country, and to highlight the main aspects of logic in order to be in attendance with the formation related to KO. It chooses the major of Information Management of the Federal University of Parana — UFPR — as the empirical observation field. It presents the position of logic in the professional profile of the identified majors according to the curricula available in the sites, material which is taken as the corpus of the analysis. It identifies a quadrant in which some tasks are imposed to the professional performance, in a rhythm of expansion and more precise specifications, related to a paradigm in which would be included the terms artificial intelligence, smart system, technological monitoring. It observes that the programs studied are predominantly turned to the analysis of the forms of reasoning and to the representation of knowledge, and denounces the fragmentary conception. It searches the pedagogical aspects of this curricular presence in graduation programs, relating it to the disciplines of the specific domain of KO. It analyses the disciplinary contents linked to aspects of logic in the curriculum of IS, in order to cast informations to the discussion of a program with an interdisciplinary focus. It highlights the relevance of the subject to the great domains on which the processes of information are based, and emphasizes the need for an interdisciplinary conception.

Keywords: Collage, Curriculum, Information Science, Interdisciplinarity, Knowledge Organization, Logic.

Resumen

Se realiza una reflexión sobre la presencia de la lógica en el dominio de la organización del conocimiento (KO), particularmente en el campo de la Ciencia de la Información (IS). Se trata de identificar en los planes de estudio de 42 escuelas/facultades de Ciencia de la Información en Brasil, el espacio curricular que se destina a esta materia, para poner en evidencia las relaciones entre esta disciplina y las tareas prácticas y competencias esperadas en el perfil de los profesionales de la información de este país, así como destacar los principales aspectos de la lógica que pueden servir de apoyo a la formación relacionada con la KO. Se elige el centro principal de Gestión de la Información de la Universidad Federal de Parana (UFPR) como campo de observación empírica. Se presenta la posición de la lógica en el perfil profesional de los currícula disponibles, material que se utiliza como corpus de análisis. Se identifican como conocimientos en expansión la inteligencia artificial, los sistemas inteligentes y la supervisión tecnológica. Se observa que los programas estudiados se dirigen al análisis de las formas de razonamiento y a la representación del conocimiento, y se denuncia esta concepción fragmentaria. Se destacan los aspectos pedagógicos de la presencia de la lógica en los planes de estudio, relacionándola con las disciplinas del dominio específico de KO. Se analiza el contenido disciplinar ligado a los aspectos de la lógica en el plan de estudios de IS, para añadir información a la discusión de un programa con un enfoque interdisciplinar. Se destaca la importancia de la lógica en los grandes dominios en los que se desarrollan los procesos de información, y se hace hincapié en la necesidad de una concepción interdisciplinar.

Palabras clave: Ciencia de la Información, Currículum, Interdisciplinaria, Lógica, Organización del Conocimiento, Universidades.

The technique of thought will certainly not create great philosophers, but it will provide criteria for judgment and control, as well as correct the distortions of the commonsensical way of thought. (Gramsci)

1 Introduction

The legacy of Gramsci exalts the notion that every man is a philosopher: in his way, unconsciously, and once established the limits and distinctions of this “spontaneous philosophy”. It is a matter of bearing the simple-minded people towards a higher conception of life, raising them from their primitive philosophy of common sense, making viable the intellectual progress of the mass, and not as exclusive of small groups of intellectuals (Gramsci, 1995).

With feet on Modernity and eyes turned to the formation related to information and knowledge, logic exceedingly imposes itself as the technical cement of thought. It has been developed as a discipline related to the knowledge, specially language and mathematics, but its figure gets special outlines when it penetrates the professional domains of knowledge organization (KO), and, more particularly, in the field of Information Science (IS).

Moved by the desire of unveiling some aspects of its presence, this reflection departs from some questionings. What are the main concepts of logic found in the curricula of information professionals in Brazil? What are the evidences of the contributions of the discipline of logic to information manager's curriculum?

It constitutes the aims of this analysis to identify, in the programs of IS schools in Brazil, the space destined to this discipline in the curriculum, to make evident the relations between this subject and the practices and competencies related to the profile of the professional of information, as contemplated in the graduate courses in this field in the country, and to highlight the main aspects of logic to respond formations related to KO. Toward this direction goes the reflexive process that is interested in the position of logic in the professional profile of the IS majors in Brazil, as well as in the disciplinary contents related to aspects of logic, in and for the curriculum of Information Management in the UFPR, our empirical observation field.

The *corpus*, formed by the curricula of 53 IS courses available in their sites, is analyzed in two moments: the first is the reading and synthesis of all the available material; the second, a reflexion on the position of logic in this universe, in which the interdisciplinary point of view is privileged.

2 Curricular Presence of Logic in the Courses of Information Science in Brazil

The 53 courses of IS in Brazil, which refer to 42 high level learning institutions, include 30 courses of Library Science, 9 courses of Archivology, 3 courses of Library Science and Documentation, 3 courses of Information Science, 2 courses of Museology, 1 course of Information Sciences and Documentation, and 1 course of Information Management. As courses with habilitations is registered 1 course of Administration with habilitation in Information Management, 1 course of Library Science with habilitation in Information Management, 2 courses of Information Science with habilitation in Library Science. Forty courses make available their curricular structure in their sites; among these, twenty make available the curricula, as well.

The position of logic in the IS formation in the country is that of a discipline present in 38 courses (71,7%), including the majors of Library Science, Information Science, Information Management and Archivology, and no one of Museology.

The analysis considers results from previous studies, based on the IS literature, from which it observes the environment of KO imbricated with alternative spaces, discoveries and technological advances, whose boundaries were widened toward themes such as knowledge management and competitive intelligence. In face of the different points of view and of the amplification of the domain of KO, it is identified a quadrant in which some tasks are imposed to the professional activity which are in rhythm of expansion and of more precise specifications, related to a paradigm in which would be included the terms artificial intelligence, smart system, technological monitoring, and others that literature presents in order to signify a pragmatic structural direction, with the aim of facilitate the representation and use of the acquired and organized knowledge.

Besides the relation of reciprocity or mutuality among concepts, practices or aspects of the phenomena, or of a particular area of knowledge, the reading of the contributions conducts to some conclusive considerations, highlighting the tendency towards a theoretical and epistemological basis, which could make common language easier in order to succeed in the comprehension of some fundamental concepts in the field of IS.

From a pedagogical point of view, it is necessary to be aware of the relational dimension of the curricular logic, whose appropriation as a species of “instrumental” discipline or knowledge requires some cares, when treating on an essence that potentially feeds itself and is fed by other disciplines. This is equivalent to take into pedagogic consideration aspects that extrapolate the measuring of the contents of knowledge implied in a certain curriculum, and to face up the learning methodology of each (other) discipline, like articulated axes of approximation and intersection to logic present in the course, promoting a conception and a practice which are effectively interdisciplinary. In the landscape of the graduation in IS analyzed here, the disciplinary fragmentation still stands out.

The analysis of the majors allows us to states that: a) The studied programs are predominantly turned to the analysis of the forms of reasoning and to the representation of knowledge; b) they present, in a more or less comprehensive way, some topics about nature and structures related to the concepts, as well as the relations between them; c) they indicate the domain of introductory concepts to representational models associated to bank systems and data bases, to the theory of faceted classification and its possibilities; d) they are turned to the method of reasoning, to the representation object, to the relation among objects, and to the forms of representation.

3 Disciplinary contents of the IS as elements for a program “with logic”

With the intention of highlighting the main aspects of logic to respond to the formation related to KO, it were analyzed disciplinary contents that are compatible with the presence of logic in the curriculum of IS, from which results bases to a discussion about a program with an interdisciplinary focus in which logic is present.

The disciplinary contents enrolled below results from this analysis, which takes for reference the course of Information Management of the UFPR.

Algorithms and data structures: categories; concepts of extension and intension (comprehension); conceptual trees; propositional calculation; binary and non-binary structures; domain cuts; Boolean algebra; modeling algorithms; algorithms development.

Analysis of information and knowledge: concept, terms and definitions; concepts of extension and intension; formal analytics of judgement; sentential logic; reasoning analytics; deductive arguments: categorical, hypothetic, incomplete and composite; enumeration, analogy and generalization; syllogisms and their rules; predicate calculation; symbolization; interpretation.

Data banks: mathematic and propositional logic; Boolean algebra; theory of assemblages; enumerable assemblages; non-enumerable assemblages; operations with assemblages.

Condensation of information: concepts, terms and definitions; concepts of extension and intension; formal analytics of judgement; sequential logic; reasoning analytics; syllogisms and their rules; interpretation; enumeration, analogy and generalization.

Software engineering: conceptual models; representation models; algorithms development; control structures programming; subprograms; symbolization; interpretation; enumeration; analogy and generalization; theory of assemblages; propositional calculation.

Information indexing: concepts, terms and definitions; concepts of extension and intension; formal analytics of judgement; sequential logic; reasoning analytics; syllogisms and their rules; interpretation; enumeration; analogy and generalization.

Infometry: interpretation; enumeration; analogy and generalization; propositional calculation.

Metadata and marking language: symbolization; interpretation; propositional calculation; representation models; enumeration; analogy and generalization; theory of assemblages.

Methodology of research: concepts, terms and definitions; concepts of extension and intension; formal analytics of judgement; reasoning analytics; deductive arguments: categorical, hypothetic, incomplete and composite; validity of categorical arguments; inductive argument and inductive probability; syllogisms and their rules; logic nature of discourse; interpretation; enumeration; analogy and generalization; formal and informal fallacies.

Data mining: conceptual trees; Boolean algebra; binary and non-binary structures; concepts of extension and intension; domain cuts; permutation and combination.

Ontology and knowledge taxonomy: concepts, terms and definitions; concepts of extension and intension; formal analytics of judgement; sequential logic; reasoning analytics; symbolization; interpretation; enumeration; analogy and generalization.

Organizing, systems and methods: formal analytics of judgement; reasoning analytics; deductive arguments: categorical, hypothetic, incomplete and composite; validity of categorical arguments; inductive argument and inductive probability; enumeration; analogy and generalization.

Text Production: logic nature of discourse; sentential logic; terms and concepts; formal analytics of judgement; reasoning analytics; deductive arguments: categorical, hypothetic, incomplete and composite; validity of categorical arguments; inductive argument and inductive probability; recognizing logical structures in the text; logical structures and organization of information.

Research project in information: concepts, terms and definitions; concepts of extension and intension; formal analytics of judgement; reasoning analytics; deductive arguments: categorical, hypothetic, incomplete and composite; inductive argument and inductive probability; syllogisms and their rules; logic nature of discourse; interpretation; enumeration; analogy and generalization.

These elements should contribute to the discussion on the curricular space of logic in the IS formation with an interdisciplinary focus.

4 Final Considerations

This analysis on the presence of curricular logic in the IS formation in Brazil contributes to ratify its theoretical-practical relevance in the domain of KO.

Both the organization of information and the organization of knowledge adopt resources that do not give up logical forms and theoretical bases of classification. Logic is present in the strategies used by computing science, in menu/directories, in the construction of indexes and search tools, in scanning complete texts and in the ontologies built to the “artificial intelligence”. The logic principles are necessary and determinative in the process of planning and making decisions. We highlight the contribution of logic, in all of its expansions, to the five great domains on which depend the processes of information management: administration, information science, communication, computing science and linguistics.

From these ascertains arises the need for the substitution of a fragmentary conception by an interdisciplinary conception about the areas that are turned to the organization of knowledge, without neglecting, however, the disciplinary identities, and reserving as a special object of what is named KO the dimensions related to the concrete product of the process of knowledge.

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