ANALYSIS OF SCIENTIFIC INFORMATION USED IN THE INFORMATION MANAGEMENT OF HIGHER EDUCATION INSTITUTIONS ACCORDING TO INTERNATIONAL LITERATURE

ANÁLISE DAS INFORMAÇÕES CIENTÍFICAS UTILIZADAS NA GESTÃO DA INFORMAÇÃO DAS INSTITUIÇÕES DE ENSINO SUPERIOR SEGUNDO A LITERATURA INTERNACIONAL

ANÁLISIS DE LA INFORMACIÓN CIENTÍFICA UTILIZADA EN LA GESTIÓN DE LA INFORMACIÓN DE LAS INSTITUCIONES DE ENSEÑANZA SUPERIOR SEGÚN LA LITERATURA INTERNACIONAL

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RESUMO: A abordagem se refere ao estudo da Gestão da Informação, no intuito de enfatizar sua relevância para a acessibilidade da informação e o desenvolvimento e disseminação do conhecimento nas diversas áreas de conhecimento. No que tange a Ciência da informação, dá-se a conexão com a organização do conhecimento, com a finalidade de demonstrar a importância dos indicadores científicos, coletados, processados e apresentados em literaturas internacionais disponíveis no Portal de Periódicos da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). Com a finalidade de demonstrar a importância dos indicadores científicos no desempenho organizacional, faz-se o levantamento bibliográfico internacional, realizando uma análise minuciosa das informações dos estudos com apontamentos sobre os indicadores científicos x gestão da informação, utilizando a literatura em língua inglesa e espanhola, descrevendo a análise o Portfólio Bibliográfico selecionado, a ocorrência das pesquisas na área, a utilização de indicadores, a visão dos usuários e sua conexão com o ambiente. A proposta incide no levantamento dos dados e informações geridas neste contexto com vistas a colaborar com o mapeamento dos registros nas instituições de ensino superior, e estudiosos do tema, auxiliando na aceleração da gestão organizacional.

PALAVRAS-CHAVE: Gestão da Informação. Indicadores científicos. Índices científicos. Revisão da Literatura.

ABSTRACT: The approach refers to the study of Information Management, in order to emphasize its relevance for the accessibility of information and the development and dissemination of knowledge in the different areas of knowledge. With regard to Information Science, there is a connection with the organization of knowledge, with the purpose of demonstrating the importance of the scientific indicators, collected, processed and presented in international literature available in the Electronic Journal of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). In order to demonstrate the importance of scientific indicators in organizational performance, an international bibliographic survey is carried out, carrying out a detailed analysis of the information of the studies with notes on the scientific indicators versus information management, using the literature in English and Spanish, describing the analysis of the selected Portfolio Library, the occurrence of researches in the area, the use of indicators, the users' view and their connection with the environment. The proposal focuses on the collection of data and information managed in this context in order to collaborate with the mapping of records in higher education institutions and scholars, helping to accelerate organizational management.

KEYWORDS: Information Management. Scientific indicators. Scientific indexes. Literature revision.

RESUMEN: El enfoque se refiere al estudio de la Gestión de la Información, con la finalidad de enfatizar su relevancia para la accesibilidad de la información, el desarrollo y la diseminación del conocimiento en las diversas áreas existentes. En lo que se refiere a la Ciencia de la información, se da la conexión con la organización del conocimiento, con la finalidad de demostrar la importancia de los indicadores científicos, recogidos, procesados y presentados en literaturas internacionales disponibles en el Portal de Revistas de la Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). Con el fin de demostrar la importancia de los indicadores científicos en el desempeño organizacional, se hace el levantamiento bibliográfico internacional, realizando un análisis minucioso de las informaciones de los estudios con apuntes sobre los indicadores científicos versus la gestión de la información, utilizando la literatura en lengua inglesa y española; describiendo el análisis del Portafolio Bibliográfico seleccionado; la ocurrencia de las investigaciones en el área; la utilización de indicadores; la visión de los usuarios, y; su conexión con el ambiente. La propuesta se centra en el levantamiento de los datos e informaciones gestionadas en este contexto con observación a colaborar con el mapeo de los registros en las instituciones de enseñanza superior, y estudiosos del tema, auxiliando en la aceleración de la gestión organizacional.

PALABRAS CLAVE: Gestión de la información. Indicadores científicos. Índices científicos. Revisión de literatura.

1.   INTRODUCTION

The present research aims to present an analysis about the application and/or approaches on Information Management combined with scientific indicators, produced in the field of Information Science, aiming to show the importance of this type of indicator as a management tool and, as a way of organizing the knowledge of educational institutions, as well as specific situations such as academic productions.

The investigation showed us the relevance of the studies focused on the area in the absence of specific works referring to scientific indicators, and a systematization of the retrieval of such information. In this way, it sought to carry out a systematized review to guide the work.

The presentation of indicators in the scientific scenario is shown as an important source of information in the decision making process (SPINAK, 1998). In view of the above, the following problem is addressed: Are there practical applications and scientific studies that demonstrate scientific indicators in the aid of information management in educational institutions?

In this sense, as a general objective, a thorough analysis of the international literature was carried out in the English and Spanish languages to identify the occurrence of research that demonstrates the use of scientific indicators in the aid of information management in educational institutions.

For the study, all the analysis and research regarding the subject of information management: scientific indicators were used searches and filters in 05 (five) databases available in the Portal of Periodicals of CAPES, in the field of Information Science referring to selection , identification, analysis and reflection of the literature published in these resources.

The article is based on: introduction, theoretical reference, methodology used for the development of the study, results and analysis of the research, final considerations - contributions and suggestions for future studies and bibliographical references.

The information management can be applied and managed by several areas of knowledge, for this observation the study was applied to Scientific Indicators and Information Management due to the fact that they are topics of recent interest in the field, however that have been studied since the 1970s in Brazil.

Information management is considered as the systemic action of searching for and understanding the informational needs of an organization and making them available for

solving organizational problems. When properly managed, the data becomes information that will serve as the basis for business decisions (PORTAL EDUCAÇÃO, 2012).

Information management and knowledge organization have been studied in several perspectives, and studies have pointed out new areas of scope as aids in organizational performance, in which it aims to organize, monitor, plan, review and fulfill the social role of organizations.

> The organization of knowledge is the science that orders the structuring and systematization of concepts, according to their characteristics, which can be defined as inheritance elements of the object, and the application of concepts and classes of concepts ordered by the indication of values, contents of objects or subjects (DAHLBERG, 2006, p.13).

However, what we are going to observe refers to the incipience of the studies in the area of Management of information related to or applied to the context referring to the scientific indicators regarding administrative support, or as a measure of performance of educational organizations.

For development it is suggested a more critical look at the environment, the distinction of indicators and measures to the specific activity, considering the involvement of decision makers, users, institutions and all activities managed there.

It is also worth mentioning the alignment between decision and action, adapting these new activities to the already existing strategy (MICHELI and MANZONI, 2010), important that these measures have a connection with action and, later, with management action (OTLEY, 2001).

Organizational development, whether by private or public entities, has been increasing in Brazil, since the volume of information for organizational development is extremely relevant to business survival. In this context, organizations' investments in activities are (i) collection, (ii) storage, (iii) data processing, and (iv) informational relationship. These actions are increasing in the process and this statement translates into many studies addressed through science and information management. The volume of organizational information as well as the quality perceived by the managers and employees involved is no longer only with purely managerial or production looks, but with strategic characteristics that saves time, costs, equipment, people through the informational potential.

Having this research, the intention to investigate related information management practices, and to detect the scientific indicators contained in the international literature, which may help in the resolution or visualization of problems of the area and in the process of organizational management.

2. INFORMATION MANAGEMENT

With the technological advancement tied to Information Technology, information systems and data processing there has been, the facilitation of organizational, human, strategic and behavioral issues involving public and private entities.

However, the management and clarity of the usefulness of this information become increasingly important so that strategic use information is effective and does not spread from the organization's mission as a whole or even when applied to specific departments or activities.

De Sordi (2008) points out that the logic of today's business is that the management of data available in the organization, as well as those obtainable by partnerships and associations, can become an important strategic resource if planned, coordinated and monitored by the organization. Of course, the higher the challenge, the greater the organization's preparation for resources: data, information and knowledge.

What has been noticed in the organizations is that with their development, the activities are divided by departments, which can be of production, marketing, human resources, commercial, financial among others, obviously according to the activity performed by the organization. However, this subdivision, the occurrence of information without connections, that is, each department manages its objectives and goals and, in the majority is not given the observance that such information may be relevant not only in your department, which may also be the same management of other departments or activities.

The intention of the information management study approach is to integrate information between the organization's internal departments and also with its stakeholders so that it does not occur to the informational duplicity and thus the accumulation of files; the updating of the information through this collaboration giving added value to these contents, having the optimization of the time seen its accessibility with the shared information; agility for decision-making; the improvement of processes due to the visualization of their entire context; and consequently more assertive strategic decisions for the business.

About history and evolution we go through some periods such as the Industrial Revolution, the development of the Technological Age, and nowadays we live the so-called Information Age, in which every day we are nourished by an immensity of information that reaches people in different ways , whether oral, written, collected through documents, images, media, systems, sounds, etc.

The fact is that we are constantly transmitting and producing information, which refers to our past, present and future, and this informational volume must be directed, filtered, concentrated and developed to the point where we generate constructive information that

areas of knowledge and the various forms of business performance and improvement. Here, an analysis of the information management as a source of clarification and development of the organization of knowledge of institutions, so that it does not occur simply the information accumulation and organizational rework, but rather, the importance of information in the process of scientific management.

Information Science is aligned with several areas of knowledge and, in this approach, it is presented to scientific indicators and their connection with educational institutions, and the management of the information managed for this purpose.

In this sense, consider the information, its origin and relevance have been preponderant for organizations. We live in the information society, however, real progress will only occur for those organizations that perceive and assimilate the new information society (RODRIGUEZ; FERRANTE, 1995).

The sharing of information, its management, organization and structure are presented as roles of Information Management, in which it is necessary for the achievement of organizational objectives. The continuous expansion of the data circulating in organizations, including data from customers, partners, suppliers, employees, materials, productivity, assets and, above all, their transactions with the organization, enables managers to obtain useful information and knowledge, whether for the improvement of current products and services, or for the design and launching of new products and services, including the entry of the organization into new business segments, in a way different from those already established in the segment (DE SORDI, 2008).

We are driven by our information and, not unlike organizations, know how to use and direct such information to the appropriate sources becomes a resource for improvement. Information management supports the entire organizational context, its departments or subsystems, helping managers to make decisions, making it possible to verify their situation in the market where it is inserted, communication between internal and external stakeholders and survival.

For Gameiro (1994) information is the source ordering the decision, which is the foundation of the administration, consequently responsible for the success of the enterprises. Information management may or may not be tied to technology, this distinction appears to the extent that it is necessary to apply the technological resource to the agility of management.

Its purpose is to support and facilitate communication between the tactical, strategic, operational levels and its stakeholders according to the need of the organization providing useful information at the correct time for strategic management. Beal (2008) points out that Information Management is focused on the collection, treatment and availability of

information that supports organizational processes in order to achieve its permanent objectives.

In this way, the Information Management focuses on the search, identification, classification, processing, storage and dissemination of information to reach people and facilitate the management of resources and inputs and decision making.

In this approach, the scientific indicators analyzed by the management of the organizations have a greater assertiveness in the strategic actions.

2.1 Analysis of scientific indicators/índices

Taking into account the participation of the indicators, which can be understood as indexes, in order to evaluate the performance in the organizational environment, it is identified its connection with the strategic planning function of the organization, in order to control, record and analyze the institutional policies , actions of professionals or organizations, assisting in the organization and its activities of direction, control, training, maintenance and allocation of resources among other activities involved.

To the indicators in their approach makes us realize that it seeks to know and measure the performance of individuals and the organization, establishing a comparison between expected performance and that presented by individuals and / or organizations, which allows the development of improvement programs that may decrease or even fill organizational shortcomings.

The Rationalization des Choix Budgetairies (RCB) manual edited by the French Government defines an indicator as:

> a data relative to a significant variable that characterizes a phenomenon and that serves as indication so that one can act on such phenomenon. According to this manual, in order to get the most out of it, the formulation and analysis of indicators must be articulated according to their use: input, output, status and management. In addition to these categories, indicators can still be classified as simple and complex (SANCHES,1997).

In this context, the study of scientific indicators plays a fundamental role as a result of its intervention in the policy of action and regulations managed through educational institutions. The observation of these indicators, their application in the measures of evaluation of institutional performances, serves as a means of obtaining managerial information and its effectiveness which permeates the activities and functions of educational achievement, and can also be used to observe deficiencies and provide policies of institutional improvement since they are capable of showing us a view of the panorama to which the analysis is being applied.

The indexes and/or indicators are likely to occur throughout the organization, with or without the use of methods, where any observance of value or evaluation can be seen as an indicator, the important thing is the specification and knowledge of which fact or situation will be so that these indicators are aligned and provide assertive results.

In order to meet the needs, requirements, visualization and survival of institutions, mechanisms have been vital that present indicators as a way of measuring performance.

Performance assessment should be able to ensure the implementation of the strategy, positively influence performance, and identify when it is necessary to intervene with corrective actions on significant performance gaps (NEELY et al., 1995; MELNYK et al., 2014), which aid to identify the causes of satisfactory or unsatisfactory performance, the contribution of each employee, to promote self-development and self-knowledge and plans of corrective actions. In this way Sink and Tuttle (1993, p.20),

> They analyze business performance by interrelating seven criteria: efficiency, effectiveness, quality, productivity, quality of work life, innovation and profitability, which can be disaggregated as indicators for future managerial analyzes in the context of higher education institutions.

In order to strengthen this quantitative aspect, it is essential to aggregate metric studies in order to make possible other aspects of the relationships represented by such indicators, such as graphs, densities, centralities, intermediations, neighborhoods, occurrences and estimates, which is the sum of cooperation between two or more points, or simply a projected scientific frequency (PINTO et al, 2007).

However, they do not have the desired result, as institutions are unaware of their indicators, which may restrict the performance of institutions. Its usefulness strengthens the strategic variables, supporting information management, knowledge organization, facilitating the understanding of the whole process and the internal and external strategies of the institutions.

3.   METHODOLOGIC PROCEDURES

In this step we will deal with the methodological framework of the research, the selected intervention instrument and the procedures for data collection and analysis.

3.1 Methodological framework

This study is characterized as exploratory, since it deepened the knowledge about the problem researched, generating reflection and knowledge regarding the delimitations of the study, in this case, the publications to be analyzed in the Bibliographic Portfolio. In relation to the proposed objective, it is classified as exploratory and descriptive, as it demonstrates the characteristics of the data found in the publications of the Bibliographic Portfolio.

The study is carried out with secondary data, in this case the articles selected for the composition of the Bibliographic Portfolio. The Bibliographic Portfolio translates as being an intervention instrument, which requires that the researcher initiate the process of explaining the knowledge that represents and tune the subject, to do so using the areas of knowledge that are called the research axes, represented by words key alignment, alignment to the abstract and alignment to the theme, thus giving rise to a fragment of the composite literature for the analysis of this research.

With regard to the approach to the problem, its characteristic is qualitative, aiming the analysis of the characteristics found in the publications, in an attempt to identify possible contributions, suggestions and possible gaps to deepen the research in the area of scientific knowledge under study, thus responding to the research problem.

As a method for bibliographic research, since it allows researchers to select and analyze the publications of the Bibliographic Portfolio from the CAPES Portal of Periodicals database, identifying the production about the subject under study.

3.2 Procedures for Data Collection and Analysis

To reach the objective, the fragment of the literature was reviewed, which deals with Information management: scientific indicators, being necessary the selection of the Bibliographic Portfolio. As an intervention tool for data collection, this study used a systematic literature review on the international bases, which helps researchers in the selection and analysis of the scientific literature, against their interests, choices, delimitations and objectives.

For the analysis, the selection of the Bibliographic Portfolio was traversed, in order to assist the researcher, to deepen and to base the research on the scientific relevance.

After the identification and verification of the international approaches, Bibliographic Portfolio, and the described practices regarding the subject Information Management: scientific indicators; it will be possible to measure the relevance of the theme, perform a critical analysis and identify gaps in the literature related to the theme, in order to propose challenges for future work and research objectives.

The data collection had its occurrence from the selection of a Bibliographic Portfolio. Having for the selection the definition of 02 (two) search axes characterizing the search command. As characteristics, the articles were only in the English language and Spanish, with the temporal delimitation between the years 2007 to 2010, using 05 (five) databases, being aligned after verifying the title, summary and full availability of the article.

From the process of data collection, it is characterized as follows:

ENTRIES

Theme: Information Management: scientific indicators

Axis 01: Information Management

Axis 02: Scientific indicators / scientific indices / scientific dimensions

Search command: ("information management" AND "scientific indicators" OR "scientific indicator" OR "scientific indexes" OR "scientific dimension" OR "scientific dimensions" OR "scientific index").

Bases Consulted: EBSCO, EMERALD, PROQUEST / LISA, SCOPUS and WEB OF SCIENCE.

Result: 600 publications.

No excluded journals: 1 serial, 583 book session.

Number of duplicate publications: 1 duplication.

Gross result: 15 publications.

Exclusion for lack of alignment of the theme in the title: 5 publications.

Exclusion for lack of alignment of the theme in the summary: 2 publications.

Publication not retrieved: 1 publication.

Availability in full and bibliographic portfolio for the study: 07 publications.

Therefore, the Bibliographic Portfolio under the fragment of the literature on the subject of Information Management: scientific indicators has a portfolio containing 07 (seven) articles for the analysis, allowing the final analysis in the perception of the following criteria:

A. Ways used to visualize scientific production in the international literature,

B. Applied contexts,

C. And gaps in the field of research and opportunities for further research.

4. THE APPROACHES IN THE BIBLIOGRAPHICAL PORTFOLIO

In a more detailed study of the Bibliographic Portfolio, in order to identify the characteristics of the studied content, a content analysis was performed.

Each content studied presents its characteristics and purposes that are peculiar and in this descriptive one makes the visualization of the characteristics analyzed and their relation and participation to increase the evaluations and contributions in a scientific context.

The first analysis refers to the article Acquisition of T-shaped expertise: an exploratory study available in the EBSCO database, its approach explicitly expects to identify professionals with characteristics for the performance and solution of complex problems (politics, culture, technology and scientific dimensions).

The arguments take into account the interdisciplinary knowledge of specialists, characterizing these 'T' experts as being professionals with a wide range of knowledge, interaction and learning. The analysis takes place through an exploratory study in two educational programs from January to May 2015.

The programs studied have disciplinary knowledge in science, engineering, technology, and the fields of mathematics, being demonstrated the awareness and understanding of other knowledge.

The data analyzes were carried out through pre and post tests, with the mapping of concepts intended in 500 articles, which allowed to analyze the learning and acquisition of students' knowledge, its usefulness and limitations to evaluate knowledge and evolution over time. According to the article, concept mapping offers results that are promising, but need to be analyzed more robustly.

It was also possible to see that the students recognize that the multiple experience (T-shaped professionals) expand their understanding if the applied activities take place outside the laboratory and expressed greater awareness of their limits and related experience to other areas of knowledge.

He points out that the union of scientists, engineers and other areas of knowledge can work with shared goals and can support and collaborate to solve more complex problems. In this way, T-expertise can be considered as a set of capacities that allow integration of the knowledge itself with the knowledge of others. Where:

> Educators and employers must engage in a continuous dialogue on the 'T characteristic', the experience and the building of additional assessment tools that detect differences between these innovators, 'responsible' with T-experience and people with only traditional knowledge disciplinary sets at your disposal (CONLEY, COLEMAN; DENHAM; FOLEY; GORMAN, 2017).

The information contained in this first analysis is shown to be complementary to the scientific context, since it allows for analyzes that translate into a greater measurement and association capacity of the sciences. However, it is limited to the study of articles and their mapping which may limit the analyzes and their comprehensiveness.

As discussed in the second article, the Scientific Comparison between Web of Science (WoS) and Google Scholar: A Study from the Most Representative Authors of Brazil available in the PROQUEST / LISA database, analyzed and compared the productivity and citation indexes of the 10 Brazilian authors more apparent in the ISI, which the authors characterized as the Top 10 Brazil.

The analysis occurred through the authors' citations in the Web of Science and Google Scholar, through the use of quantitative and qualitative scientific indexes. The scientific

visibility occurred with a temporal analysis of 5 years, which made it possible to identify the citation, cocitation and cooperation network of the authors, which were demonstrated through maps, graphs and tables.

He presented the importance of databases for scientific production and demand versus supply in emerging countries. And the similarity in the retrieval of the data in the bases, regarding: bibliographic description, peer review, open access, references of other publications, such as books, letters and scientific abstracts and citation indexes, differences and similarities. Their analytical demonstrations had a qualitative and quantitative character.

The article demonstrated the reliability of the search bases and their performance factors from a perspective of the scientific production of the researchers, but when it comes to scientific analysis, these are not only restricted to citation and cocitation, but may also extend to cooperative relations and networks , places where it is possible to perceive higher production, training and alignment of these professionals, among others. What is possible is a more critical view, the greater possibilities of studies and deepening of the mentioned criteria, not leaving it to be relevant because it is rather a form to which surveys and estimates must be carried out, since they make up the institutional evolution framework.

Regarding the third analysis, on the article Differentiating, Describing, and Visualizing Scientific Space: A Novel Approach to the Analysis of Published Scientific Abstracts also available in the PROQUEST / LISA database, the authors demonstrate an understanding that science is a social and evolutionary process, and bring up the question of citation index as a way to investigate scientific networks and social dynamics.

They cite that the submitted works are explored and used according to several procedures of analysis and visualization that shape the scientific framework through the use of citation indices, their themes, relations and cooperations instead of exploring the meaning and semantics, the application of latent semantic analysis for the analysis, differentiation and visualization of scientific documents, which then point the bases as the form and procedure applied to study citation patterns.

The latent semantics, which according to the authors, are capable of characterizing the dominant themes within science, grouping articles according to their field designations, which allows to visualize the results in a principle-based way, and allows visual representations of the relationship between scientific articles and fields, presenting benefits to document indexation and its potential application for citations analysis.

This, in turn, is based on the theory of semantics and the language of acquisition developed by psycholinguists and computer scientists, the meaning of emerging words and the associations between them, their co-occurrence. The article also demonstrates the usefulness of the process of differentiating and visualizing an index of scientific articles on

the basis of their abstracts, and proposes ways in which the resulting spatial representation of science incorporates in citation analysis, represented in each document, in terms of a number of variables or semantic dimensions through the construction of a term-to-document, a multi-field dataset.

Também demonstram quantitativamente que a diferenciação semântica latente é capaz de classificar corretamente artigos científicos por campo com um alto grau de precisão com base em seus resumos. Porem, suas aplicações concretas, quanto à utilidade do procedimento para os administradores é discutida e oferece uma visão sobre a distribuição, concentração e sobreposição de recursos intelectuais. Além das aplicações práticas para o conteúdo científico indexação, diferenciação a semântica latente que poderão ser utilizadas para promover um programa de pesquisa científica examinando padrões de citação na base das características espaciais do índice.

And it can be used to obtain the variables capable of testing whether spatial demographics of the articles can be responsible for variations in their citation frequencies and be applied to any representable system in terms of textual data, to evaluate changes and patterns within the system over of the time, and offer valuable information about the processes of selection and transformation that characterize them, being more a critical analysis under the forms of representation of the citation indexes, fixing its restricted look in this universe.

The fourth article, Contributions of Turkish academicians supervising PhD dissertations and their universities to economics: an evaluation of the 1990-2011 period, available in the PROQUEST / LISA database, analyzes the doctoral theses held at Turkish universities in the period 1990- 2011 and the publications indexed by the teachers who supervised these theses. Includes publications from Google Scholar, Web of Science and Scopus, and citations from publications.

There were 617 teachers who supervised the 1,906 PhD theses in the field of economics. They referred to the University of Istanbul, Marmara University, Dokuz Eylül University, Ihsan Dogramaci Bilkent University, East Technical University East and Bogazici University. Where, in their results indicated that there are positive and significant relationships with doctorates abroad and the number of publications in the Web of Science.

They pointed out that the contributions of these dissertations to international science are discussed. In an attempt to determine the level of contribution of dissertation supervisors to the economy and the data used for the study is limited due to data collected from dissertations completed at Turkish universities. The methodology presented in the study included statistical techniques, different tables and graphs of universities and teachers with their publications.

They presented dissertations held at the institutes of social sciences of the universities offered to the doctoral programs in economics, as well as the performances of the scholars who carried out these theses. It was possible to identify that Turkish academics are behind in the academic world in terms of number of publications per teacher and the number of citations of these publications by several factors.

Also, publishing in journals with international recognition requires an effort with no financial return and indicates that obtaining a doctorate degree abroad has a positive effect on publishing in the Web of Science Journal compared to obtaining a doctorate degree at a Turkish University. This study was based on an exclusive view of the performance of the university referred to above and opens a reflection for applications in other institutions under the same perspective, so that one can actually measure the ranking in the academic world.

The fifth analysis refers to the article Multiple h-index: a new scientometric indicator also available in the PROQUEST/LISA database, which evaluated some scientific indexes, using virtual data and proposed a new index, called multiple h-index (mh-index).

Statistical analyzes, correlation coefficients and related comparative diagrams showed that mh-index is more accurate than the other nine variants in differentiating the scientific impact of researchers with the same h-index. They started from the idea that the scientific society needs an index that accurately evaluates the scientific production of the individual researcher.

And they described the citation report (number of articles and citation, self-citation, means index h) randomly selected with H-indices, recorded in a checklist for the study. The categorization showed that the indices could be categorized as to their productive nucleus. The article was grounded so that the scientific world uses and evaluates the output of scientific production, and can be an evaluation tool for researchers for its scientific necessity, but presents a high level of complexity in its application and categorization, making it difficult to replicate the study.

The sixth article, The Subject Sameness Index: A new scientific indicator from the PROQUEST/LISA database, addresses the scientiometric indicators for quantitative and qualitative evaluation of scientific production and demonstrates that the indicators have strengths and limitations, proposing a new scientific indicator (*SSI*).

The study was conducted over a period of six years (2005-2010) analyzing all articles published by researchers at Babol University of Medical Sciences, who were the first authors with at least two papers listed in the Web of Science (WoS). Their conclusions show that the quantity of publications, quotations and combinations are not always adequate indicators of the quality of scientific work.

RDBCI: Revista Digital Biblioteconomia e Ciência da Informação
RDBCI : Digital Journal of Library and Information Science

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The SSI indicator can add important information of interest to research managers and scientific editors, which also helps to formulate scientific policies, facilitate scientific communication, and design a global scientific map. The authors point out that currently available indicators are not adequate to measure some important aspects of scientific production and the researcher's focus on a particular subject category.

They emphasized the appearance of the sameness of subjects contained in articles, articles with the repetition of synonyms or keywords subject to all the keywords used by a researcher. They pointed out the importance of the researchers being aligned to the theme and nomenclature of the publications seen by the visualization of the dispersion of the investigators' efforts. And that index correction depends on which databases are used to retrieve documents. An article that is easy to read, which arouses the care and attention that the researchers need to be allied by presenting as a method the complementary evaluation in which the quality of the scientific productions.

Finishing the analysis with the article Qualis Periodic: Brazilian scientific policy indicator?, available in the EBSCO database, which presents the intention to understand and analyze how Qualis and its criteria participate in the editorial routine of Brazilian scientific journals.

The presentation of the appearance of Qualis, its operation and modifications. The study points to a bibliographical survey about the theme, interviews and ethnographic studies related to the editors of scientific journals in the area of Education.

They analyzed Qualis as a scientific indicator for the construction of a concept of quality of the publications, they dealt with questions about the quality of the articles, criteria of arbitration of texts, publishing agencies, origin of works, periodicals and indexing, the importance of Capes.

And, they have shown that Qualis is used as an indicator to aid in financing, in the orientation of researchers, in the submission of papers and in research, and in stimulating the editors to raise the quality standard of their journals where the elements of standardization, internationalization and regularity are presented as factors that guide the definition of quality in the national scientific production, measured by indicators such as Qualis, where it needs improvements to maintain the quality level.

However, they emphasize that Qualis promotes scientific recognition and merit of journals and interferes in scientific policy and the qualitative improvement of researchers and educational institutions.

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4.1 Suggestions for new research

After the results obtained in the operationalization of the steps, it was possible to identify points of studies regarding Information Management: scientific indicators, which may promote other discussions aimed at the development of new knowledge and approaches. These are:

A. Need to define metrics in a clear way, because it was possible to identify that the detection of information and its indicators is a necessary procedure in the evolution stage of the management of institutional information, causing the control of academic and scientific occurrences;
B. Suggestion as to the evaluation of the indicators, which in the next studies are clearly and objectively related to a better understanding of the measures;
C. Regarding the information management, the qualitative and quantitative part of the information was observed, with a strict look at scientific productivity and not the management of the institution;
D. Some models are indicated for analysis in relation to a problem, rather than to enable the use of the mechanisms specifically;
E. Regarding the indicators, it is suggested that the analyzes are also related to the characteristics of each institution and their perception;
F. Studies of the metrics in the view of the users;
G. In relation to the models used, indicate the improvement of the services, to mention the mechanisms and the positioning of the participants;
H. It is suggested that in the next analysis the evaluations are related to the scientific impacts; and forms of management support;
I. The analyzes may provide a better description of the quality and its indicators.

It can be concluded from the analyzes carried out that studies relevant to the application or observation of Information Management: scientific indicators can be further explored, either in the evaluation, re-evaluation or complementarity of existing publications or the gaps listed above.

5. CONCLUSIONS

The analyzes made it possible to identify that they do not have explicit indicators to measure the performance measures of educational institutions, their goals and dimensions for later evaluation. They are diverse and varied forms of analysis of scientific production, but; this article did not obtain works strictly linked to indicators related to the activities and forms of work of higher education institutions (resources x production).

The review of the evaluation models leads us to think that there is a great gap for research and formulation of the study on what would be the appropriate indicators for

visualizing the management of scientific information. Therefore, this article can be considered a premise for the occurrence of new studies.

The studies were presented with analysis in several countries, carried out the analysis of how they have the Information Management practices and the scientific indicators been treated in order to provide knowledge and new challenges and research for the area.

From the limitations, consider periodicals made available in English and Spanish, limited to five databases present in the CAPES Portal and the author's intervention in the analyzes.

It was possible to observe difficulties regarding the determination of scientific indicators, data collection and registration of information which were implied in some articles, lack of a structure of a system of indicators explicitly demonstrated.

In this way, the relevance and importance of indicators and measures for the Management of Scientific Information in Educational Institutions still presents without the notoriety before a market in continuous growth and visibility. Therefore, in order to help and achieve the institutional objectives, visualization of the production and use of the users, control of the processes, improvements among other aspects that fit into the management of the institutions of higher education suggests new approaches and descriptions on Information Management: Scientific Indicators.

REFERENCES

BEAL, Adriana. Gestão estratégica da informação: como transformar a informação e a tecnologia em fatores de crescimento e de alto desempenho nas organizações. **São Paulo: Atlas**, 2004.

CONLEY, Shannon Nicole et al. Acquisition of T-shaped expertise: an exploratory study. **Social Epistemology**, v. 31, n. 2, p. 165-183, 2017.

DAHLBERG, Ingetraut. Knowledge organization: a new science?. **Knowledge organization**, v. 33, n. 1, p. 11-19, 2006. Disponível em: <http://www.db.dk/bh/lifeboat_ko/CONCEPTS/knowledge_organization_Dahlberg.htm>. Acesso em: nove. 2017.

DE SORDI, José Osvaldo. **Administração da informação: fundamentos e práticas para uma nova gestão do conhecimento**. Saraiva, 2008.

GAMEIRO, Maria Cristina. Sistemas e metodologia de arquivos nas empresas. In: **Sistemas e metodologia de arquivos nas empresas**. Cenadem, 1986.

MELNYK, Steven A. et al. Is performance measurement and management fit for the future?. **Management Accounting Research**, v. 25, n. 2, p. 173-186, 2014.

MICHELI, Pietro; MANZONI, Jean-Francois. Strategic performance measurement: Benefits, limitations and paradoxes. **Long Range Planning**, v. 43, n. 4, p. 465-476, 2010.

NEELY, Andy; GREGORY, Mike; PLATTS, Ken. Performance measurement system design: a literature review and research agenda. **International journal of operations & production management**, v. 15, n. 4, p. 80-116, 1995.

OTLEY, David. Extending the boundaries of management accounting research: developing systems for performance management. **The British Accounting Review**, v. 33, n. 3, p. 243-261, 2001.

PINTO, Adilson Luiz et al. Indicadores científicos na literatura em bibliometria e cientometria através das redes sociais. **Brazilian Journal of Information Science**, v. 1, n. 1, p. 58-76, 2007. Disponível em:<https://dialnet.unirioja.es/descarga/articulo/4366117/1.pdf>. Acesso em: 02/10/2017.

PORTAL DA EDUCAÇÃO. A importância da Gestão da Informação. 2012. Disponível em: <https://www.portaleducacao.com.br/conteudo/artigos/esporte/a-importancia-da-gestao-da-informacao/15645>. Acesso em: 02/10/2017.

RODRIGUES, Martius V.; FERRANTE, Augustin J. A tecnologia de informação. **Rio de Janeiro: Infobook**, 1995.

SANCHES, Osvaldo Maldonado. **Dicionário de orçamento, planejamento e áreas afins**. Prisma, 1997.

SINK, Scott; TUTTLE, Thomas C. **Planejamento e medição para a performance**. Qualitymark, 1993.

SPINAK, Ernesto. Diccionario enciclopédico de Bibliometría. **Cienciometría e Informetría**, 1996.

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